COMPUTER GIFT GUIDE
HOLIDAY BEST BETS

CHILDREN'S TELEVISION WORKSHOP • DECEMBER 1984 • $1.75

ENTER®

THE WORLD OF COMPUTERS AND NEW TECHNOLOGY

DUNE!

A High-Tech Sting: The Computer As Movie Outlaw

TALKING TO 2010's HAL

MICROCHIP MYSTERIES

PROGRAMS: Apple, Atari, C-64, TRS-80, Timex, TI, IBM, VIC

Sting of The Police in 'Dune'

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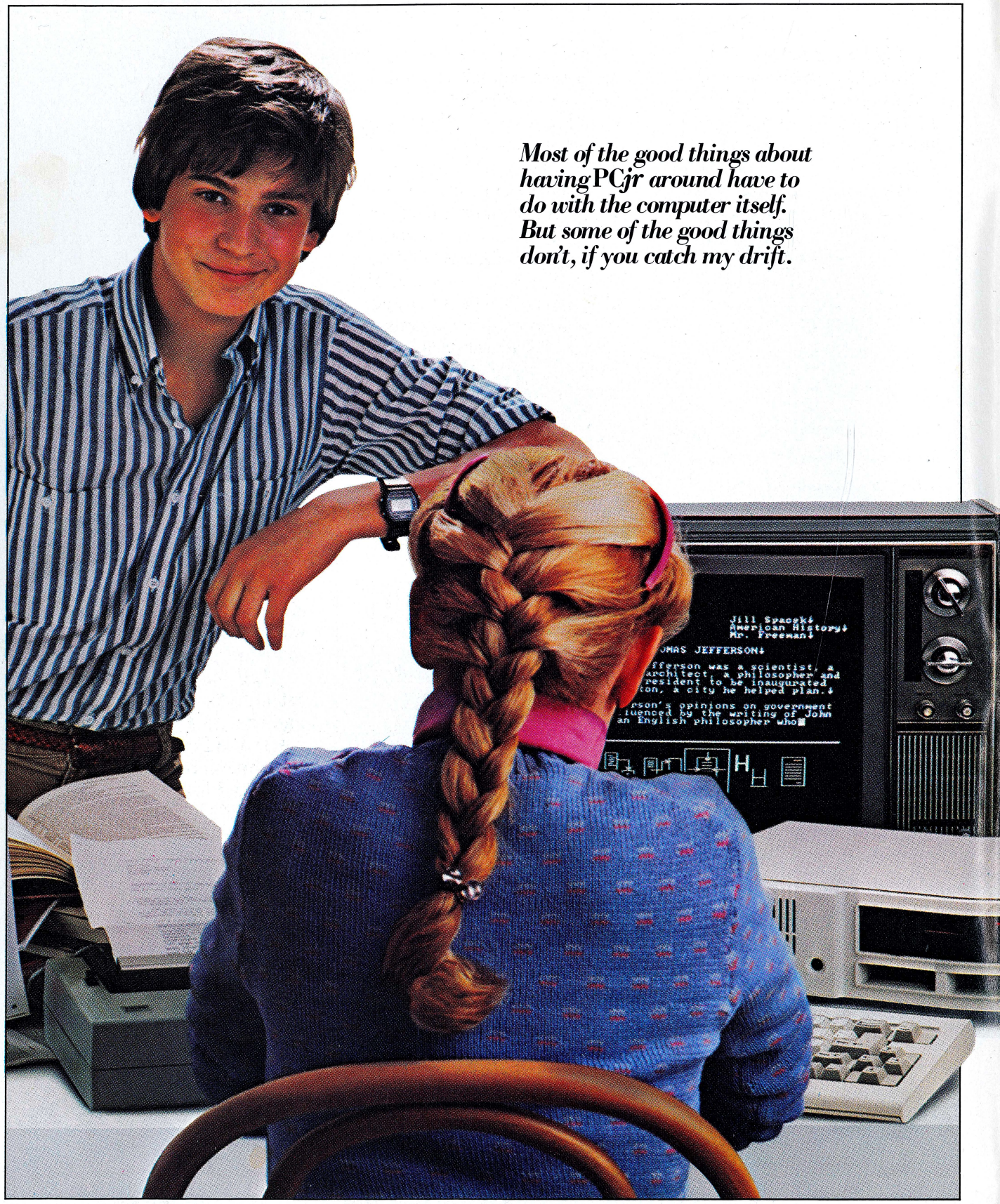
The advantages of owning the IBM PC*jr.*


Most of the good things about having PCjr around have to do with the computer itself. But some of the good things don't, if you catch my drift.
Jill Spacek
American History
Mr. Freeman
OMAS JEFFERSON
fferson was a scientist, a
architect, a philosopher and
resident to be inaugurated
ton, a city he helped plan.
rson's opinions on government
luenced by the writing of John
an English philosopher who

by Andy Cunningham

My friend Jill here (it's not quite to the "girlfriend" stage yet) likes my PC*jr* almost as much as she likes me. Maybe more. Every time she's got a paper or something to do, she comes over here to do it.

One advantage* PC*jr* *has over other computers is the awesome amount of stuff you can get to go with it. Games, printers, monitors, modems, joysticks—five birthdays' worth at least.

That's the way it goes when you get a computer. Your friends will expect you to let them use it. Some of them will even expect you to teach them how.

I don't really mind. For one thing, they're my friends. And for another thing, for such a powerful computer, PC*jr* is easy to learn. So getting somebody started on it isn't any big deal. (Especially somebody as intelligent and talented as Jill.)

You know all the things you can buy to customize a car? Well, IBM has all kinds of things (they call them "peripherals") to customize a PC*jr*. If you want to play games, you'll probably want a couple of joysticks. If you have to write term papers (it's not a question of wanting), you'll need a printer. If you want to connect up to electronic information libraries over the telephone (you'd be amazed at how many there are), you'll have to have something called a modem.

What you end up buying besides the computer itself all depends on what you plan to use the computer for. But whatever you have in mind, PC*jr* can probably handle it. That's because IBM designed this computer to accept all kinds of peripherals, including things that haven't even been invented yet.

I don't want to get too technical on you, but there's one technical thing you ought to know about the PC*jr*. It works exactly the same as the original IBM Personal Computer, because it has the same microprocessing chip (the brains of a computer) inside it. That means that a PC*jr* and a PC with the same amount of memory can run nearly all the same software. And that's important, because it seems like more people are writing more programs for the PC than for any other computer around.

IBM PC*jr* SPECIFICATIONS

Memory
User Memory (RAM): 64-128KB (expandable to 512KB)
Permanent Memory (ROM):64KB

Diskette Drive
Double-sided, double density
Capacity 360 KB

Processor
16-bit 8088

Keyboard
Typewriter-style
Detached; cordless

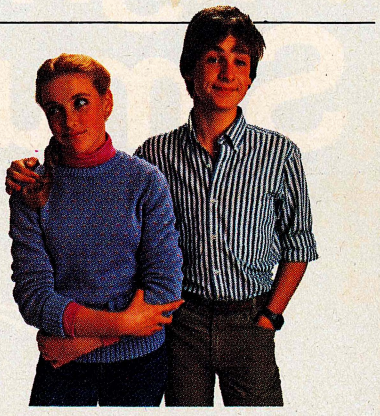
Warranty
1-year limited warranty

Software
Runs over 1,000 programs written for the IBM PC
Runs both diskette and cartridge programs

Display
40- and 80-column
Resolution:
4-color: 640h x 200v
16-color: 320h x 200v

Expandability
Open architecture
Option 128KB Memory Expansion Attachment(s)
13 ports for add-ons, including built-in serial interface

Even if you don't know exactly what all these facts mean, you can still use them to compare* PC*jr* *to other computers.



Sometimes it's easy to forget, but there's more to life than just computing.

I like to think that I'm a regular, all-around kind of guy with lots of different interests. I'm telling you this because I don't want you to get the idea that I just sit at my computer all day. The way I see it, a computer is just a thing to help you get stuff done.

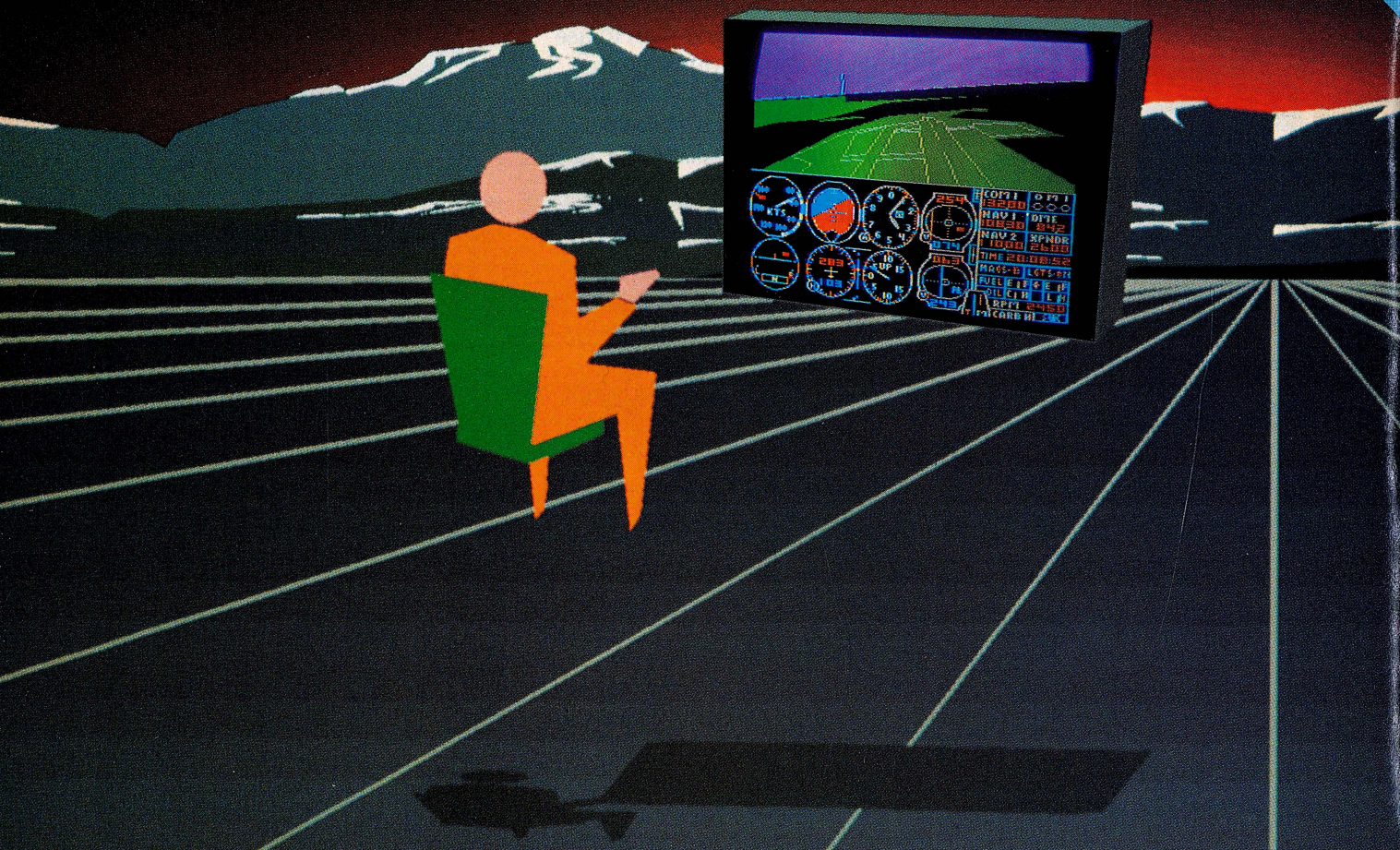
And since my PC*jr* helps me get stuff done, it seems like I've had lots more free time since I got it. And I'd say Jill's had more free time since she's been using it. So wouldn't you think the two of us would have time to go to the movies together once in a while or something? Well, it's like I said before. Not quite at the "girlfriend" stage yet.

IBM PC*jr*

To see the IBM PC*jr*, just call 1-800-IBM-PCJR for a store near you. In Alaska or Hawaii, 1-800-4890

Flight Simulator II

For Apple, Atari®, & Commodore 64™



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MENU
DECEMBER 1984

ENTER
VOLUME 2, NUMBER 3

FEATURES

'DUNE' AND '2010': DIGITAL DOUBLE FEATURE 30
Computers will never seem the same after *Dune* and *2010*, the holiday's hottest movies. *Dune*'s author tells why computers are outlawed on his planet; *2010*'s director tells why the computer HAL might be a hero.

WISH LIST '84 38
'Tis the season to give gifts—even to your computer. ENTER readers make a wish and pick their favorite hardware, software and peripheral presents.

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Don't break the bank to buy a robot. A look at low-cost, high-fun robots.

A KATIE PARKER CAPER 42
Can Katie and her computer nab a gang of nasty thieves?

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Whodunit? You're the detective who has to follow flowchart twists and turns if you want to catch the crooks.

CONTEST WINNERS! 53
Who were the famous Face-Off faces? Where was F.R.E.D. the robot? Meet the winners of ENTER's first two contests.

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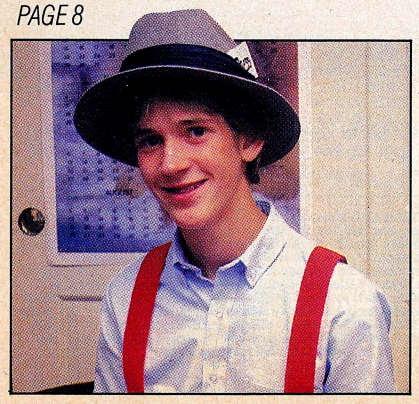

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Cover: Photo © Dirck Halstead/ Gamma-Liaison

INSIDE STORY

It's amazing how fast things change in the computer age. Last year's holiday issue of ENTER included a story about what we thought was a big decision for many readers: "Should you buy a game system or a computer?" This year, *not one* ENTER reader mentioned game systems when we asked what high-tech gift he or she would most like (See "Holiday Wish List").

We know that the computer world will keep changing. Computers next year will be more powerful, easier to use, and more affordable than ever. In the December, 1985, issue of ENTER, there will probably be things on our readers' "Holiday Wish List" that you can't even *imagine* today.

My personal wish list for 1985 is short. I'm not expecting anyone to fulfill these three wishes. But I'd be happily surprised if even one came true.

- *No more "Hacker Gets Caught Breaking In" stories.* Let's face it: breaking into someone's computer is a dumb thing to do. All the energy that goes into accessing a store's database, or a credit company's computer, would be a lot better spent on creating a great computer game, or thinking up a clever use of software. And then young computer users wouldn't be treated with such suspicion, either.
- *An end to TV commercials that say that kids will be failures if they don't buy the 'Brand X' computer.* These commercials are dishonest. No one has to worry about his or her life being a failure if there's no computer in the house. Computers can be fun, useful, and educational. People should buy them for that reason—not because they're afraid their lives will be ruined without one.
- *Lower software prices.* If books cost $3 to $25, and records run from $6 to $15, why should software be so much more expensive? Software prices are going to have to come down if computers are ever really going to be for everyone.

Whatever is on your wish list, we hope you have a great year computing in 1985.

Ira Wolfman
Editor

ENTER®

VOL. 2, NO. 3, DECEMBER 1984 © 1984

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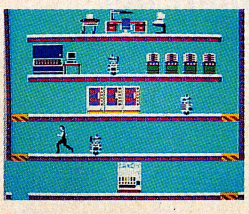
YOUR MISSION–TO SAVE THE WORLD.



As a member of the exclusive Anti-Computer Terrorist Squad (ACT), your mission is to find and reach the infamous Elvin, who is holding the world's population hostage under threat of nuclear annihilation. You must negotiate a path through the rooms and tunnels of his headquarters trying to avoid Elvin's robot protectors.

Should you try to outrun or jump over the next robot or play it safe and take the time to assemble the codes needed to deactivate the robots and then to find and stop Elvin.

Use your camera to photograph as many clues as possible to find the password which will allow you to penetrate Elvin's control room.

Your Mission—To Save The World, But Hurry!

One player; joystick controlled.

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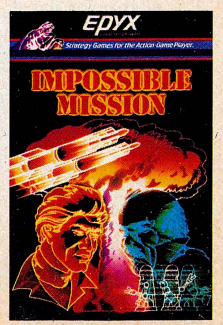


FEEDBACK

BASIC DRAWBACKS

I am writing in response to the "Random Access" article in the September issue ("Why Programming Bugs Me"). I think Stephanie Kaufman is absolutely correct. I have had a few years of BASIC programming myself, and I can't really use the computer in a "practical way." I think it would be much more beneficial to all students if teachers would apply computers to other subjects.

For example, my computer instructor once asked us if we could use the computer to set up an alarm system for a house. Though I have a lot of BASIC training, I would never be able to work out that sort of system.

—Melissa Miscione
Florham Park, NJ

KOALA SHUFFLE

I love your magazine. I particularly enjoy the letters to the editor section. Often times I discover I'm not alone in my confusion, and your answers to others' questions have helped me as well. Now I have a question.

My friend and I disagree on who wrote the Commodore 64 software for the KoalaPad. He says that Island Graphics wrote Micro Illustrator for use on all machines. I think he's wrong. I say Audio Light, Inc. wrote the KoalaPainter for the Commodore. Who's right?

—Ellyn Freed
San Francisco, CA

© DANIEL QUAT

Dear Ellyn: You are. According to Koala Technologies, Audio Light wrote KoalaPad software for the Commodore 64 and the PCjr. Meanwhile, Island Graphics created Micro Illustrator software, later renamed Micro Painter, for Apple and Atari systems. The source of your friend's confusion may be the fact that originally the KoalaPad software was called Micro Illustrator for all systems. The entire line is now called KoalaPainter. —Ed.

PROGRAM PAGES

I think it would be great if you could do one issue on programming. —Jim Simpson
Esmont, VA

Dear Jim: You might say your wish is our command. Be on the lookout for the April issue of ENTER. In addition to our regular BASIC Training, we'll have a super-special Challenge, a "So You Think You Know Programming" quiz, and a lot of ideas for new projects you can do on your computer. —Ed.

POLICE POINTER

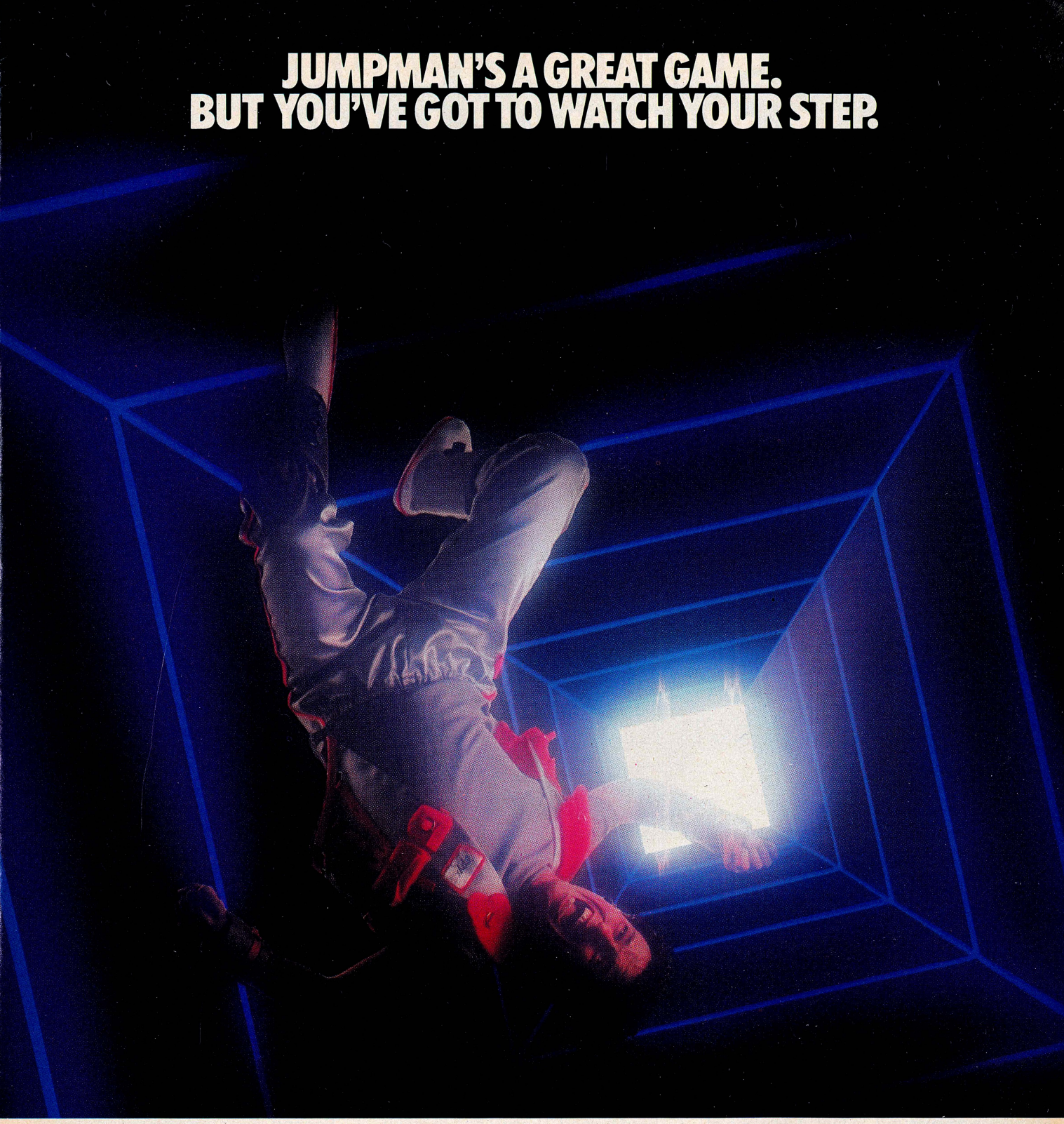
In your article "Rock on the Road" (September 1984), you mentioned a Police song, supposedly called "Footsteps." The actual title of the song is "Walking in Your Footsteps." Being an avid fan of the "Bottle Blonds," I couldn't let an error like the one you have made go by. Please be careful on song titles next time. —Cec Switzky
Sycamore, IL

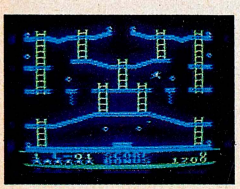
Dear Cec: You're right, and we shall. But in all fairness, The Police's concert lighting designer Nick Sholem did refer to the songs in question as "Footsteps" a number of times during our interview with him. Obviously it's easier to use the abbreviation than to repeat the whole name of the song over and over. However, we should have mentioned the full name somewhere. —Ed.

WRITE US!

ENTER wants to hear from you! Our CompuServe ID is 72456,1776; our Source number is BBI113. Or write to us at ENTER, 1 Lincoln Plaza, New York, NY 10023.

JUMPMAN'S A GREAT GAME. BUT YOU'VE GOT TO WATCH YOUR STEP.





Meet the Alienators. A fiendish bunch who've planted bombs throughout your Jupiter Command Headquarters.

Your job? Use your lightning speed to scale ladders, scurry across girders, climb ropes and race through 30 levels to defuse the bombs before they go off.

That's the kind of hot, non-stop action we've packed into the award-winning,* best-selling Jumpman,™ and into Jumpman Jr.,™ our new cartridge version with 12 all-new, different and exciting screens.

Both games force you to make tough choices. Should you avoid that Alienator, climb to the top and try to work your way down, or try to hurdle him and defuse the bombs closest to you before they go off?

If you move fast you'll earn extra lives. But if you're not careful, it's a long way down.

So jump to it. And find out why Jumpman and Jumpman Jr. are on a level all their own.

One to four players; 8 speeds; joystick control. Jumpman has 30 screens. Jumpman Jr. has 12 screens.

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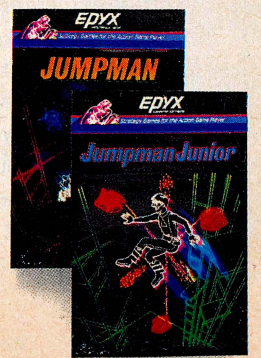

*1983 C.E.S. award winner.

RANDOM ACCESS

EXTRA! MY SPECIAL EDITION

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Being the editor of my own computer magazine wasn't easy—but it *was* fun.

BY ANDY ZIVIC, 13

For a few months last year, I was editor-in-chief of a computer magazine. I wrote the articles, designed the magazine, and made all the decisions.

The magazine was called *APPLE ACCESS: The Computer Magazine for Everyone!!!*, and it wasn't one of the bigger magazines around. In fact, it was one of the smallest. I started it myself, for kids and teachers at my school in Hollis, New Hampshire.

I thought starting a magazine would be a great way to learn more about computers and meet other kids interested in computing. I also thought being an editor would be exciting. I saw myself putting together a slick 80-page, full-color magazine that would go out to thousands of subscribers.

It didn't work out quite that way.

I began my magazine last winter. At first, I did everything. I wrote the articles and programs, designed the art work, and put it all together.

That first issue was jam-packed onto one page. It was messy and hard to read. I knew I had to make it more appealing.

It took me a few weeks to rewrite and edit what I'd done. But when I brought my new, improved magazine to school, the reaction was discouraging. Some kids said it was boring. Others complained the programming was too simple. I needed help if my magazine was to be a success.

So I teamed up with some of the kids at school. It helped to have other people's ideas. One kid's father worked with a computer company and was able to get us an interview with Tom Luhrs, a game designer who had worked on games like *Appleoids* (an Apple version of *Asteroids*).

My assistants and I worked together for about three months before coming out with the finished product. APPLE ACCESS was 11 pages long, and had lots of black-and-white illustrations. The magazine included programming for the Apple, the interview with Tom Luhrs, helpful hints, reviews and columns. And we even had a programming contest, with the grand prize an APPLE ACCESS T-shirt. Everyone who saw the magazine was impressed.

Putting out APPLE ACCESS caused me a lot of headaches, but it was worth it. I learned a lot about computers, made some friends, and met a game designer.

I also learned a few things about starting a magazine. These tips might help you if you decide to put out your own magazine. First of all, don't do it by yourself. Get other people's ideas and help. Second, don't try to cover too much. Any more than a couple of pages at the beginning gets to be too much work and too expensive.

I didn't exactly become rich and famous. But I had fun. And, after all, I started at the top.

ANDY ZIVIC wrote this column on an Apple IIe.

ROBOTS OF DAWN.™
BOOK BY ISAAC ASIMOV.
COMPUTER GAME BY EPYX.

YOU ARE INSIDE AN AIRFOIL. THE ROBOT SAYS, "WHERE DO YOU WISH TO GO?"
? TO THE ROBOTICS INSTITUTE
THE GARAGE DOOR OPENS, AND THE AIRFOIL RISES ON ITS JETS OF COMPRESSED AIR AND SWAYS A BIT. FOR JUST A MOMENT YOU FEEL A QUEASY SENSATION IN THE PIT OF YOUR STOMACH AND THEN THE CAR MOVES FORWARD SUDDENLY AND YOU ARE PUSHED HARD AGAINST THE SEAT. YOU TRAVEL FOR SOME TIME BEFORE THE AIRFOIL STOPS IN FRONT OF A LARGE BUILDING. YOU HURRY INSIDE, FIGHTING YOUR FEAR OF OPEN SPACES.
THIS IS AN ANTEROOM. TO THE SOUTH AN EXIT LEADS OUTSIDE, TO THE NORTH IS A HALLWAY. DANEEL IS HERE.
?NORTH
DANEEL SAYS, "FRIEND ELIJAH, BE CAREFUL. THERE IS A TINGLE FIELD IN THAT DIRECTION."
?NORTH

Now, for the first time, you can become Earth's most famous science fiction detective, Elijah Baley. In this text adventure, you're the hero of Isaac Asimov's top-selling novel, Robots of Dawn.™

Travel to Asimov's world of the future in an epic quest to discover the answer to the eternal question ...Who done it? On a planet where robots outnumber people, try to learn who is lying, who is telling the truth and, most important of all, who is the murderer.

The victim is a friend of yours, a famous scientist who invented history's most advanced robot, more human than machine. With this sophisticated robot at your side, you piece together elusive clues scattered across a hostile planet whose government is determined to do you in. Can you stay on the case? Can you solve the mystery? Who do you trust? Your success depends on the answer.

Asimov created the story. We created the game. *Now you can live it.*

One player: Keyboard controlled; disk or cassette.

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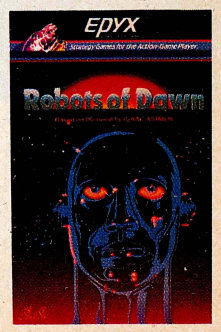

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ASK ENTER

BY DAVID B. POWELL

CUT-RATE COMPUTING

DEAR ENTER: I am very interested in computers and programming, but I can't afford to buy a computer. What do you suggest I do?

—Todd Hahn
Hagerstown, MD

DEAR TODD: First of all, you *may* be able to afford a computer—if you don't mind buying one that has been taken off the market. For instance, T.I. and Timex-Sinclair computers may still be available at some computer stores, and at prices under $50. If you can't find bargains like those, consider taking a computer class. Adult education centers frequently offer low-priced introductory lessons. You might also consider joining a local user's group. Many welcome members who don't yet own a computer.

If you simply want to find out how a computer works, the Judy/Instructo Company (4325 Hiawatha Ave. S., Minneapolis, MN 55406) can help. They sell two "paper computers" that teach how computers operate. "Mister Micro and the Cardboard Computer" sells for $4.95. It uses sliding cardboard strips to simulate program lines, memory locations, and other computer functions for six sample programs. "The Amazing Instructo Paper Computer" ($7.95) comes with 16 programs. However, the programming languages are closer to Assembly than BASIC.

The 800XL: more RAM than the 800.

ATARI 800 vs. 800XL

DEAR ENTER: What are the differences between the Atari 800 and the 800XL?

—Billy Magee
New York, NY

DEAR BILLY: A big difference between the old 800 and the newer 800XL is the maximum memory possible. On the 800 it was 48K RAM; on the 800XL, 64K. The 800XL also comes with built-in BASIC, a HELP key, and 11 graphics modes instead of the 800's nine.

Not all 800 software will run on the 800XL. Atari sells a diskette called "The Translator," which it says can convert 95 percent of Atari 800 games so they will work on the 800XL. It requires 64K of memory and costs $9.95. If you're interested, get in touch with an official Atari users' group. They are allowed to distribute "The Translator" free to members.

HOW BIG IS A BLOCK?

DEAR ENTER: I have seen the word "block" referring to memory on a disk. What does it mean?

—Matthew Clapp
Phillips, WI

DEAR MATTHEW: "Block" is a term used to measure amounts of data on a floppy disk. Usually, it is the amount transferred from computer to disk when you use a READ or WRITE command. The size of a block will change depending on the computer.

Before you can use a disk, it must be "formatted." A format is like a map the computer draws electronically on the disk.

When it is formatted, a disk is divided into areas known as "sectors." This way, the Disk Operating System can keep a record of where data is stored.

Blocks are usually made up of several sectors. Depending on the computer, disk sectors can be 128, 256, 512 or 1024 bytes long. So blocks can range up to several kilobytes in length. (A kilobyte is 1,024 bytes.)

WRITING YOUR OWN GAMES

DEAR ENTER: I have a Commodore VIC-20 and would like to know how to start writing game programs. I am just learning how to program. Can you give me few tips?

—Brian Bridgeford
Chino, CA

DEAR BRIAN: Creating a game is one of the best ways to learn programming. There are hundreds of books and publications

(Continued on page 12)

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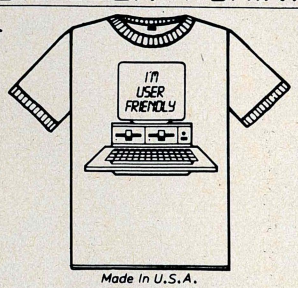

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ASK ENTER

(Continued from page 12)

that will teach you how to start writing games in BASIC. Here are a few for the VIC-20 and other computers:

- *COMPUTE!'s First Book of VIC Games*, $12.95
- *Creating Arcade Games on the Commodore 64*, $14.95
- *Golden Flutes and Great Escapes: How to Write Adventure Games*, $9.95 (with software, $29.95)
- *Writing BASIC Adventure Programs for the TRS-80*, $9.95
- *Write Your Own Apple Games*, $12.95

However, if you really get serious about game designing, you'll have to learn assembly language for the VIC or another computer. BASIC is just too slow for the kind of action and animation we expect of computer games today.

Take a look at this month's BASIC Plus column for an introduction to Assembly languages.

MODEM TO MODEM

DEAR ENTER: I am planning to buy a modem. Will I be able to communicate with different kinds of computers, like the Apple IIe or the TRS-80 (which is what my friends have) or just with other Commodores (which is what I have)?

—Jim Harman
Nevada, MO

DEAR JIM: Modems were created to let all kinds of computers exchange information over telephone lines. As long as your friends also have modems, you will be able to communicate with their computers.

In order to "talk" to other computers, modems must transmit and receive information in the same way. Most modems include software that allows you to select common settings. This means you can set your modem to a specific transmission speed, and one-way or two-way communication.

EEK! A MOUSE!

DEAR ENTER: What is a computer "mouse," and how does it work?

—Carla Phillips
Newton, MA

DEAR CARLA: A "mouse" is a computer input device about as big as a pack of playing cards. You slide the mouse around on any flat surface, and the cursor duplicates these movements across the screen.

A mouse lets you use software quickly, without typing on a keyboard.

With graphics software, it often works like this: Using the mouse, you position the cursor over a picture of a brush. Then you push the button on the mouse. This puts your computer into a "paint" mode. Hold the button down and the cursor leaves a trail behind it as the mouse moves.

If you flip a mouse over, you'll see how it works. It has a ball for a foot. This ball freely rotates in any direction as you move the mouse across a surface. Little wheels—called "stepper motors"—press against the ball. These wheels translate the movements of the ball into electronic signals that then control the cursor on your screen.

DAVID B. POWELL is an ENTER contributing editor.

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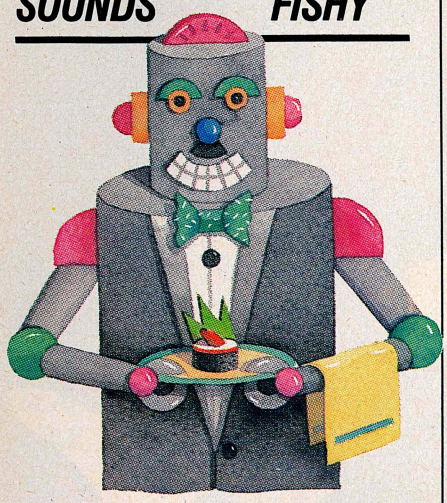
BITS

SOUNDS FISHY



If you knew sushi like Hitoshi Tanaka knows sushi, you might have come up with this idea.

Tanaka knows that computers, robots and other gadgets are big hits in the U.S. He also knows that sushi, a favorite Japanese food made from raw fish, squid and octopus, is becoming more popular in this country.

So Tanaka's company, the New Meiji Group of Gardenia, California, is planning to open a chain of high-tech sushi restaurants.

The plan calls for customers to use a light pen to select their favorite fish from a computer screen menu. The food will then be delivered by robots and conveyor belts. In a recent test run, everything worked—except the robot.

The robot didn't malfunction, says Tanaka. It's just that Americans "like talking to the sushi man" who can explain how to eat this unusual fish dish.

ROBOTS WITH TEETH

These robots don't eat a lot of sweets. But the Emory University robots still have to go to the dentist every day.

The robots, developed by Dr. Frank Faunce, are helping the University dental school in Atlanta, Georgia, train future dentists. The robots are life-like and, above all, fearless. They'd better be fearless, since they open wide for dental students still learning to handle a drill.

The current group of human-looking robots simply open-wide on command. But Dr. Faunce hopes that the next set of robots will have sensors attached to their robot teeth. This way the robot could yell if the drill went too deep.

What does a robot yell?

OUCH! Of course.

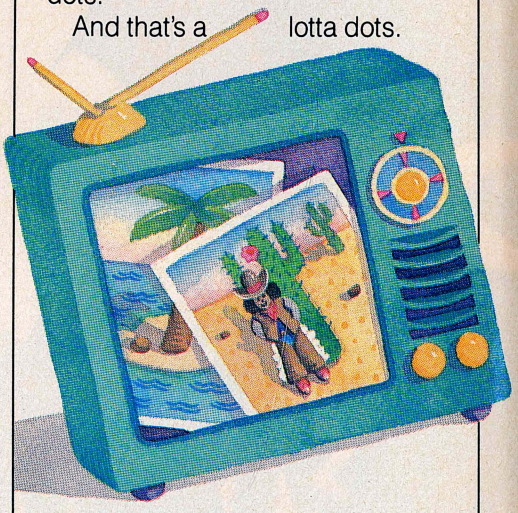
FORGET THE FILM

What good is a camera without film? Very good, if it contains a special computer chip that stores and creates picture perfect images.

Several major camera companies, including Canon, Kodak and Polaroid, are trying to perfect this technology. This computerized camera will store images on a magnetic disk similar to the floppy disk used with many home computers. The images stored on this disk could then be shown on a TV screen, transmitted over phone lines, or reproduced like a regular picture.

According to experts, the technology isn't totally new. Sony introduced a computerized camera called the Mavica in 1981. But that camera's computer chip could only store 280,000 dots of light. To get a clear picture, the chip must be able to store about 10 *million* dots.

And that's a lotta dots.



A SOUND IDEA

In the Broadway musical *My Fair Lady*, Eliza Doolittle had to learn to correctly pronounce this phrase: "The rain in Spain falls mainly on the plain." She finally got it, but only after exhausting two teachers.

Today, Eliza could learn to speak correctly without wearing out her teachers. A special computer system called the "Video Voice Speech Training Program" produces an on-screen graphic pattern that shows the way a phrase *should* sound. The person using this system speaks into a microphone hooked up to the

ILLUSTRATIONS © MARY LYNN BLASUTTA

computer. They then try to match the graphic pattern with their own voice. This computer system, created by Micro Video Corp. of Ann Arbor, Michigan, even keeps score.

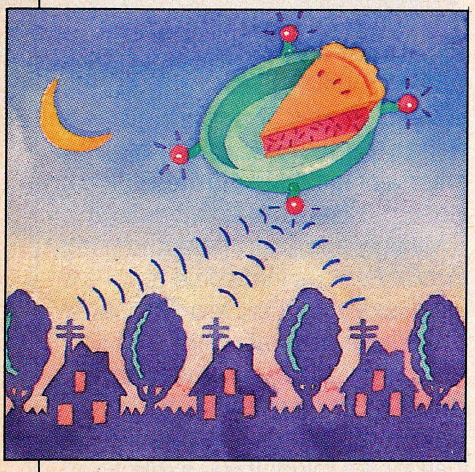
Sounds like a fine idea. But it probably wouldn't be a very good Broadway musical.

SKY TALK

NASA has "pie" in the sky plans for the way we will communicate in the future.

The U.S. space agency hopes to launch pie-shaped satellites that will allow anyone with a simple hand-held radio to communicate with other such radios around the world. According to its developers, the Lockheed Corporation, this satellite could be ready within five years.

The satellite will fold up small enough to fit into the space shuttle. Once released into orbit, it will unfurl to the shape of a 300-foot wide pie tin, and pick up even



weak radio signals.

Who ever thought a pie in the sky could make it possible to talk to a tiny radio in Timbuktu?

COMPUTER ORPHANS

You bought the wrong computer. You didn't mean to. It just happened.

Have no fear. Brian Keenan of the International Computer Orphanage (ICO) is here to help. ICO matches under-used and second-hand computers with prospective computer "parents." In exchange, this Mississauga, Ontario, company offers the original computer owner "orphan dollars." These can be used towards the purchase of the right new computer.

Keenan claims there may be as many as 600,000 under-used computers in North America. He hopes soon to open new ICO stores in U.S. cities to take care of this problem.

If you can adopt a Cabbage Patch™ Doll, why not a computer?

ROYAL MICROS

Prince William of England is only two years old, but he already has a lot to look forward to. He's second in line to become King of England, and his royal family just bought new computers.

The royal family won't reveal what brand of computer they use. But they spent $186,000 for personal computers during the past year and a half. And we know they're using a Hewlett-Packard 250 PC, a gift from the President of the United States.

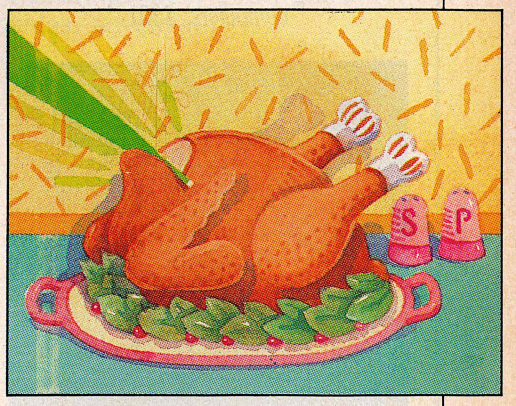
Unfortunately for little Prince William, games don't appear on the royal menu. So far, the micros are being used for answering mail, balancing the family budget, and keeping track of horses.

It seems only fair that if the Queen can have her ponies, the Prince should get his *Pac-Man*.

LASER SLICER

You knew Luke Skywalker brought his light sword into battle. But did you know that he probably uses lasers to slice the pot roast?

In fact, all of us might soon be



using lasers to slice up Sunday dinner. Rocco Lobriaco, a laser expert at the Mid-West Biolaser Institute, predicts the first kitchen lasers will probably be found *inside* microwave ovens. These lasers will carve your main course automatically when it's finished cooking.

After that, we might even use small lasers to slice hard-to-cut food at the dinner table. A laser knife could easily take on a tough steak or crack through a coconut.

Careful with that laser knife, Skywalker... and pass the interstellar asparagus.

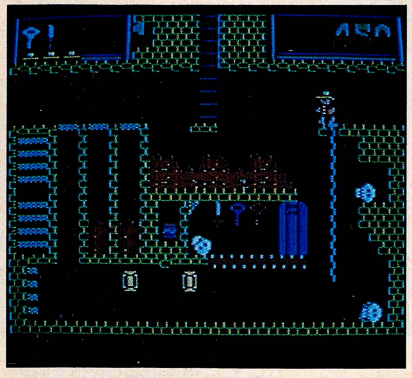
USER VIEWS

NEW COMPUTER GAMES

BY PHIL WISWELL AND BERNIE DEKOVEN

MONTEZUMA'S REVENGE

(Parker Brothers, cartridge for Atari computers; also for Commodore 64, ColecoVision, IBM PC and Apple computers; $30)



This is one of the best Parker Brother games we've played. It is an action adventure reminiscent of *Activision's Pitfall II*. In this game, you guide Panama Joe through labyrinths of ladder-connected rooms in search of treasures. You can walk, climb ropes, and jump chasms. You have to learn to combine various actions to survive.

Dozens of different rooms have their own special traps. In one room, it will be flames; in another, you'll come across gaping pits, roaming beasts or rolling obstacles. You're not just collecting treasures; you must also pick up keys and weapons. The keys open doors that connect various sections of the game.

This action game is something like one of those wooden boxes that opens with a series of sliding pieces. No piece will move before you've solved the previous one.

WRAP-UP

PHIL: I like this game a lot. I found it more difficult than *Pitfall II*. There are lots of nifty tricks to playing the game—like the disappearing floor sections and the moving ramps.

BERNIE: I find the graphics exciting and the action loads of fun. And I really appreciated the fact that when you run into an enemy, the game eliminates both you and your obstacle.

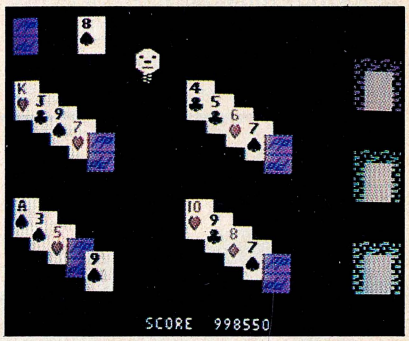
That way, you don't get stuck at that place in the game indefinitely. It really keeps the game going.

PUZZLE PANIC

(Epyx, disk for Commodore 64 and Apple computers; $35.)

Puzzle Panic is difficult. Sometimes frustrating. Even downright exasperating. And the order in which the puzzles are presented does not feel correct. It takes hours to conquer the first puzzle.

But this game is very different from everything else in your collection, and you will likely appreciate the variety to be found within the 43 different puzzles, grouped into 11 different families. Most involve figuring out a musical or visual sequence or pathway by manipulating a character with the joystick.



Believe us, these puzzles can be tough.

The real challenge of this game is to find a way to make it through all 43 puzzles in the one and only correct order. You see, when you finish a puzzle, three doors on the side of the screen will open to reveal some strange symbols. The correct choice will take you to the next puzzle, but incorrect choices may send you back to puzzles you already finished!

WRAP-UP

BERNIE: There is exceptional value in the extreme variety of entertainment found in these video puzzles.

My only complaint about *Puzzle Panic* is that some of the puzzles start out too difficult, and others become very tough very fast.

PHIL: True. And every puzzle is really designed more for the wrist than for the mind. If you expect a thinking game, you'll be disappointed.

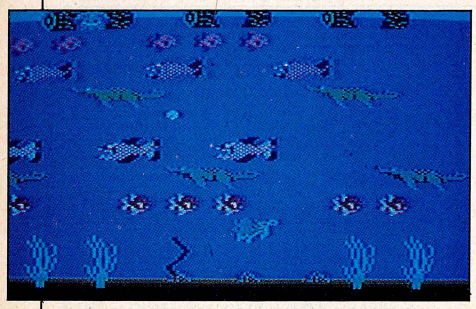
But at least this isn't one of those "bang-bang you're dead" games.

FROGGER 2: THREEEDEEP!

(Parker Brothers; cartridge for Commodore 64; Also for Atari computers, ColecoVision, Atari 2600 and 5200; around $30)

This new hopping game has some original twists on its ancestor, *Frogger*. *Threeedeep!* features three screens (one underwater, one above water, one in the air). It's a nice touch that you don't have to finish one screen to move on to the next. This way, even really bad players get a chance to see the whole game.

Control of your little frog is limited to north, south, east, and



west movement. On the first screen, you maneuver through six rows of moving sea beasts, taking advantage of gaps in their ranks to reach three bays at the top.

Screen two is more like *Frogger*. You have to avoid falling into the water by leaping onto moving objects. The object is to jump your frog into a life preserver being towed by a tug boat.

A goose comes by in screen two. If you manage to land on her back, she automatically flies you to screen three—the bounce screen. Time your jump correctly here, and you'll get onto the back of one of many birds flying across the screen. Success comes by using the birds as stepping stones to a nest at the top of the screen.

WRAP-UP

BERNIE: I think *Threeedeep!* is superior to *Frogger* because it has more variety. Graphics are very attractive and just feel more "arcade-y."

PHIL: I knew I was in for a hopping game, but I didn't think the action would be so much like that of *Frogger*. I just don't see enough here to interest the player who has already mastered *Frogger.*

XYPHUS

(Penguin Software, disk for Apple II and Commodore 64. Version also planned for Macintosh; Blank disk required; $34.95)

Xyphus is a combination of the best fantasy role-playing adventures to date: *Ultima* and *Wizardry*. The huge physical size of the world you can explore is like *Ultima*. The ability to explore that world with multiple characters is like *Wizardry*.

You can take as many as four different characters into the world of *Xyphus*. Believe us, you'll need them grouped together just to survive attacks by monsters you'll meet in the countryside. Your characters are Elves, Dwarfs, or Humans. Each has a profession of either fighter or magic user. Obviously, it's wise to have a good balance of powers among your party.

The object of the quest is to liberate the kingdom by doing away with the evil Xyphus and his subjects. You travel to all parts of the world. This consists of lots of different kinds of terrain, which affects each battle.

WRAP-UP

PHIL: This is one of those really difficult games in which your own "deaths" will be your best teacher. It is a foreign world, and don't

expect to conquer it for months.

BERNIE: Although I don't think it is as good as either *Wizardry* or *Ultima*, *Xyphus* is a very good fantasy adventure.

ANTARCTIC ADVENTURE

(Coleco, ColecoVision, around $30)

Antarctic Adventure is a game which simply has to be called "cute." It's also simple to learn.

Basically, *Antarctic Adventure* is a race game, played in relays against a timer. If you don't reach each ice station within the time limit, the game ends. Your character is a skating penguin. Your mission: jump over holes in the ice and pick up green flags that gain bonus points.

All you really do is steer the penguin, and jump the obstacles with the fire button.

Flying fish that leap out of certain small holes are worth bonus points if you can catch them. But beware of curious seals. Bumping into one will cost you valuable time.

WRAP-UP

BERNIE: The music is pleasant

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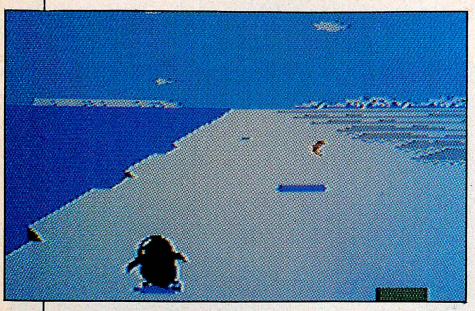


and the animation is wonderful. The changing scenery and different flags at the various ice stations are nicely done.

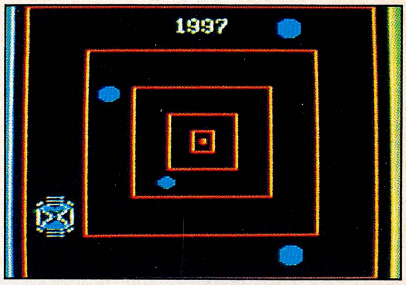
PHIL: You can learn how to play just by watching one game. There wasn't a lot here to hold my interest, but I agree that it's a fun action game for a group.

TIMEBOUND

(CBS Software, Commodore 64; Atari IBM PCjr; disk, $32.95, cartridge, $37.95)

Which was invented first: the fountain pen or the steamboat? These are the types of questions you ask yourself while playing *Timebound*, a game about the history of human inventions and progress. You travel from the year 1 to 2000. Events cover topics from sports to politics.

The object of *Timebound* is to find a character known as Anachron, who is "hiding" in an event. Anachron has the ability to move from one location in time to another, and from category to category, but you can receive clues to find his hiding place.



WRAP-UP

PHIL: *Timebound* combines fast-action joystick skills with knowledge of history. It's an educational game that doesn't bog down.

(Bernie DeKoven was involved in the design of *Timebound*, and therefore was not consulted for this review.)

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THE YEAR IN REVIEW: BEST GAMES OF 1984

We asked Phil and Bernie to rate the top games they'd seen this year. We got to listen in as they debated 1984's best.

BERNIE: I would go with *Ballblazer*, the futuristic soccer game that LucasFilm designed for Atari, as my favorite of the year. It doesn't have much depth, I know, but it's great for two players. And every detail of the game is so well refined.

PHIL: *The Seven Cities of Gold* is still #1 with me, and I play it at least once a week. I like to discover the New World in this historical scenario slowly, with an atlas by my side.

Then, for excellence of sports simulation, there is nothing like *One-On-One*. Great one- or two-player action, with lots of options and gameplay.

BERNIE: What about the adventure game *Sorcerer?*

PHIL: Definitely! That is a hot text adventure, well-written with tough puzzles.

I enjoy the fact that you use magic spells rather than physical weapons.

BERNIE: It is a very appealing fantasy. So is *Bruce Lee*, a superb two-player action game. You really get physically involved in the actions of your character.

PHIL: Fantastic game. But, Bernie, we're running out of space and haven't even mentioned *King's Quest*.

BERNIE: Or *Flip & Flop!* Or *Fortress!* Or *Championship Lode Runner...The Castles of Doctor Creep!*

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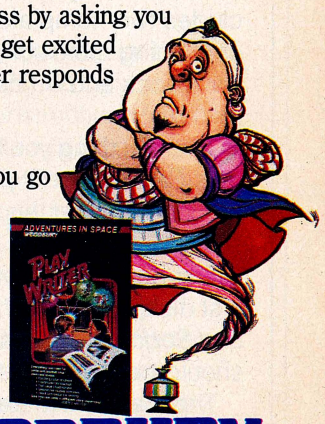

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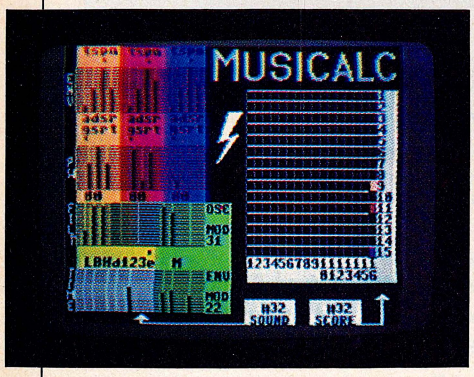
SOFTWARE SCANNER

BY HILDE WEISERT

MUSICALC 1, 2, AND 3

(Waveform; Commodore 64; Sold together as the Professional System, *$149.95, Also sold separately.)*

If you're a musician—or want to be—then *MusiCalc* is Santa Claus's whole bag and then some. The three modules—*MusiCalc 1, 2,* and *3*—are available separately, or together as the *Professional System* (which includes two "template" disks containing more songs and new wave/rock and African/Latin rhythms).



The first thing you'll notice is *MusiCalc*'s colorful picture disk—a good sign that this system is a stand-out.

The heart of the system is the first disk, *MusiCalc 1: Synthesizer and Sequencer*. This disk alone should be plenty for the novice.

The manual's three tutorials introduce *MusiCalc*'s basic workings. One: entering music—a tune, a bass line, or a rhythm track—on the "sequencer." Two: using the "synthesizer" to change the sound of your C-64's three voices. You can tune up a flute, a drum, or a Moog-ish twang. Three: turning the keys on your keyboard into musical piano keys so you can play along with *MusiCalc*.

Your main controls are on the "*MusiCalc* Panel." This is an on-line piano. On the left are rows of thermometer-like sound-shapers (the synthesizer settings). On the right is the sequencer "Score Grid." As you listen and watch, colored squares track each instrument's part.

This disk has 32 pre-set sounds and tunes to experiment with. Try turning off one voice at a time, or changing one feature of a sound. You'll get a real feel for how music is made, and what *MusiCalc* can do.

Using *MusiCalc*'s great features is *not* as easy as do-re-mi. You'll need the 72-page manual nearby. And photocopy the "Panel Guide" to save page-flipping.

The other two modules round out your sound studio. *MusiCalc 2: ScoreWriter* lets you print out your *MusiCalc 1* song grids into standard sheet music. *MusiCalc 3: Keyboard Maker* fits new notes into your keyboard, from "C Minor Blues" to your own custom scales.

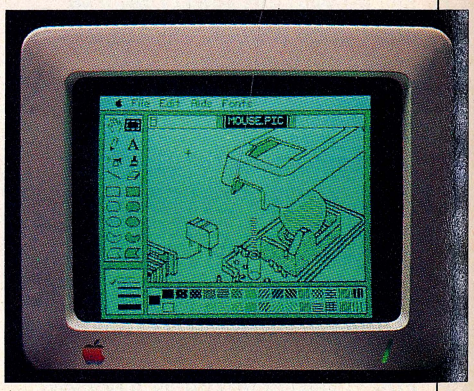
Take note: There *is* written documentation for *MusiCalc 2* and *3*, but you have to ask *Waveform* to send it to you! Ask for it, or you could be singing the program-crash blues. It's a complicated program.

For serious musicians, the *Professional System* is a great investment. If you're only into air-guitar, start with *MusiCalc 1.*

MOUSEPAINT

(Apple; Apple IIc; included in purchase of Apple IIc Mouse, $99.)

First came keyboards and joysticks. Now, there's the "mouse," the latest type of controller for computers. It's a little box that you roll on a flat surface to move the cursor around on your screen.



MousePaint is a mouse-controlled graphics program that mightily Mac-nifies the powers of your Apple IIc. (Its big brother is Macintosh's *MacPaint* program.) A simple screen tutorial shows you how to roll the mouse across your desk to draw, or register commands with a click.

With *MousePaint* and the IIc's double hi-res screen, drawing control is the best in any graphics package I've tested.

Common geometric shapes can be put anywhere, any size, in outline or with one of 31 patterns. There are disadvantages, how-

ever. You can't fill in something you drew earlier, or change patterns. Shading is sometimes clumsy.

Editing, however, is easy with *MousePaint*'s menu bar of hidden "pull-down" commands. You can move, remove, or copy any part of your picture. You can type letters in five handsome styles. "Fat Bits" zooms in nicely for close-up work. You can save your Mouse Paintings, and print them.

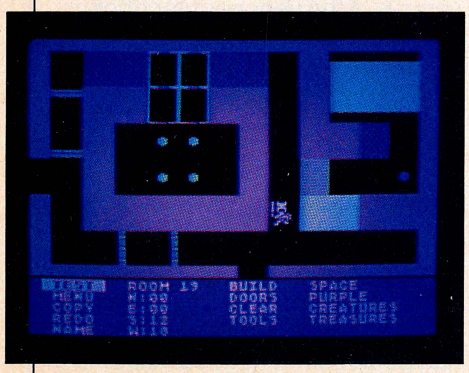
For tricky fills or shading, *MousePaint* is limited. But for creating and editing line drawings, *MousePaint*'s talent is limited only by your own.

ADVENTURE CREATOR

(Spinnaker; Atari, Commodore 64; $32.95.)

Have old games lost their thrill? If so, *Adventure Creator* could be just what the doctor ordered. You don't just play exciting maze/adventures—you get to design them, too. As you do, you'll learn some tricks of the adventure-game trade.

Maze adventures combine fast joystick action with the adventure



game's use of tools and clues to search for treasure.

Adventure Creator sets up your first quest. Your goal might be to "find an ivory scabbard" hidden in the maze. Then you're off into colorful rooms filled with helpful or horrible creatures, secret doors, and sealed treasure chests.

After a few trips around the preset maze, you'll be ready to build your own. It's exciting to see *your* title and name on the game's first screen. You plan obstacles and treasures to hide. You create weird characters from the creature menu. Just make sure you have a spare disk to save your game.

I loved all the ways the game allows you to work in personal details. (For instance, you can name a character after your friend's dog, or have the game's goal be "A date with Sue".) For friends who have everything, playing their own personalized adventure games could be a great present.

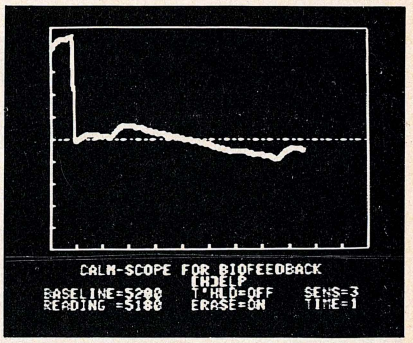
CALMPUTE

(HesWare; Apple; $99.95.)

Exams...athletic competition ...peer pressure...Being a kid isn't easy. Now your computer may give you a hand, by teaching you to control the way your body reacts to stress.

Calmpute is a "biofeedback stress reduction program." You rest two fingers on its "biosensor," a mouse-like device that plugs into the joystick port. It *doesn't* read your mind. It reads the "galvanic skin response" or moisture in your fingers, one sign of how relaxed you are.

The *Calmpute* disk turns this into colorful graphic feedback. Patterns, graphs, and audio tones change as you learn how to untense. I liked "Calm Prix," an arcade-type auto race where you succeed by being—well, laid-back on the track. The race goes to the calm.



The manual is useful, but *Calmpute* explains itself pretty well on screen. Don't tense up if you get lost: the "escape" key will take you to the Main Menu.

It's difficult to say whether *Calmpute* can really help you relax and control the stress in your life. That's quite a task for any piece of software. But *Calmpute* is fun to play with, and the biosensor is a nifty computer tool.

SPELLCASTER

(Shenandoah Software; Apple II+, IIe, Commodore 64, IBM PC and PCjr; $39.95, includes first issue of "The Spellswapper," a newsletter).

Maybe you're a whiz at Logo and Pascal. Or maybe you can't tell program instructions from the back of a cake mix box. Either way, why learn *Spellcaster*, a new programming language?

Because it's *fun*.

With its colored square tracing patterns on the screen, *Spellcaster* resembles Logo. Patterns are stored in a Program (or "spell") and you run ("cast") by typing its name.

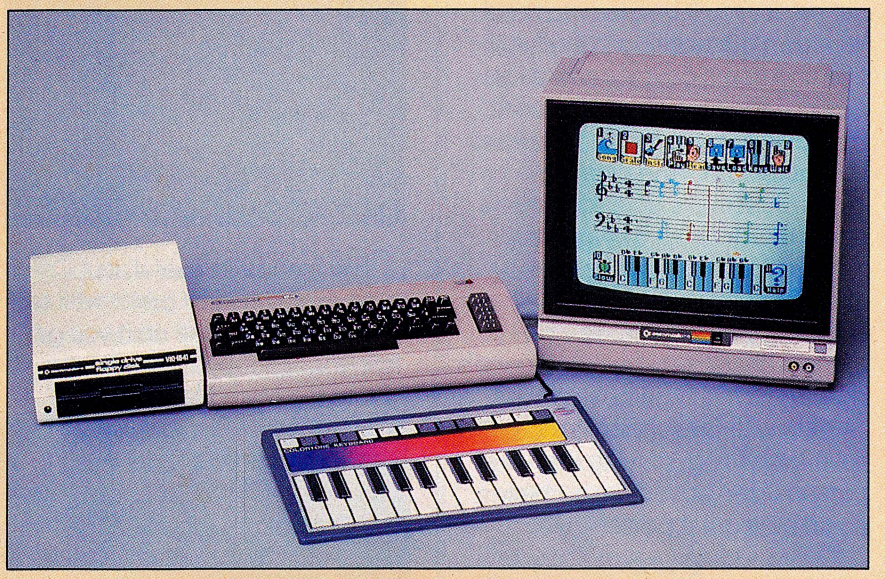
But *Spellcaster* is more than

(Continued on page 50)

NEWS BEAT

BY RICHARD CHEVAT & SUSAN JARRELL

GETTING BACH TO BASICS



Waveform's Colortone Keyboard: A new way to make computer music.

Computers can now play tunes from Bach to rock, thanks to two new software series. The peripheral and software packages from Waveform and Sight & Sound even let owners of Commodore 64s learn notation while they're making music.

Waveform's "Colortone Keyboard" is a two-octave keyboard that attaches to the C-64. It features 14 function keys, 25 piano-like keys, and a nifty touch-sensitive strip that operates like a zither. Using the Colortone keyboard and the accompanying software, you'll be able to imitate eight different instruments. As you play, the notes you hit show up on a musical staff on your computer screen. So while you're jamming to a built-in backbeat, you'll learn a bit about how music is written.

The Colortone Keyboard and accompanying software sells for $79.95. The keyboard can also be used with the new *MusiCalc Synthesizer with Sound Teacher* software ($34.95) or *MusiCalc 1* (see this month's "Software Scanner").

The Incredible Musical Keyboard from Sight & Sound fits over the keys of the Commodore 64. This keyboard lets you play melody and harmony in an eight-octave range. It also enables you to imitate instruments like gongs, bells and strings. The Sight & Sound keyboard also comes with stickers that tell you exactly which note you're hitting, and a songbook with songs like "Let's Hear It For The Boy" and "Thriller."

The Incredible Musical Keyboard sells for $39.95. It can be used with the following musical software: *The Kawasaki Synthesizer, Kawasaki Rhythm Rocker, The Music Processor, 3001 Space Odyssey* ($24.95–$49.95).

NEW INFOCOM CHALLENGES: Infocom has announced a new batch of computer thrillers that gives you a choice of pirate, intergalactic or detective adventures.

Cutthroats is the latest interactive game in Infocom's "Tales of Adventure" series (which also includes *Infidel* and *Seastalker*). In *Cutthroats*, you struggle with a gang of unsavory characters and try to salvage a sunken treasure.

"Every character you work with has the potential to be a bad guy," says author Michael Berlyn, who also wrote *Suspended* and *Infidel*. "But if you're careful, it's possible to walk through the game with everyone being friendly and helpful."

If you want to get away from the water and go out of this world, there's *The Hitchhikers' Guide to the Galaxy*. This interactive intergalactic adventure is a software version of the very popular book by Douglas Adams. Your task is to save your planet from nasty aliens that want to destroy it. Adams wrote this game with help from Steven Meretzky, author of Infocom's *Planetfall*.

Back on Earth, you can play detective in *Suspect*. This mystery adventure begins when you're invited to a party where a murder has been committed. To make matters worse, *you're* the suspect. In addition to the software, you receive a copy of *Murder and*

Modern Manners, explaining the proper etiquette for attending a murder. The game was written by Dave Lebling, who co-authored *Zork*.

SOFTWARE STUFFERS: 'Tis the season for new software:

Don't back off, cause Ghostbusters need you! Activision's *Ghostbusters,* based on last summer's hit movie, has you chasing after slippery disappearing ghosts. Just be careful, or you'll get slimed....If you watched the U.S. go for gold at the 1984 Olympics, you could be a whiz at Edupro's *Olympicks.* It's a quiz game and database of Summer Olympic facts from 1896 to the present....If you like quizzes, you'll unquestionably want to know about Suncom's *The Party Quiz Game.* This is very definitely a group game. It comes with special six-foot controllers designed for trivia team play....A game that will drive you MAD is First Star's *Spy vs. Spy.* It's based on MAD Magazine's cartoon of the same name. As in the comic strip, this duo tries to outdo each other throughout the game....Activision's *Designer's Pencil* lets you draw your own computer cartoons using the joystick or keyboard and 75 graphic and musical commands....

NEW COMPUTER: THE PLUS/4: *We asked Doug Krehbiel, ENTER's 17-year-old tech assistant, to test out the* Plus/4, *the newest Commodore entry into the home computer market. Here's his report:*

The Plus/4 is not as versatile as the Commodore 64. It doesn't have the 64's sprites, or its sound chip. It does, however, have several valuable features. The Plus/4 has 64K RAM and built-in business software. It is compact, lightweight, and costs only about $300.

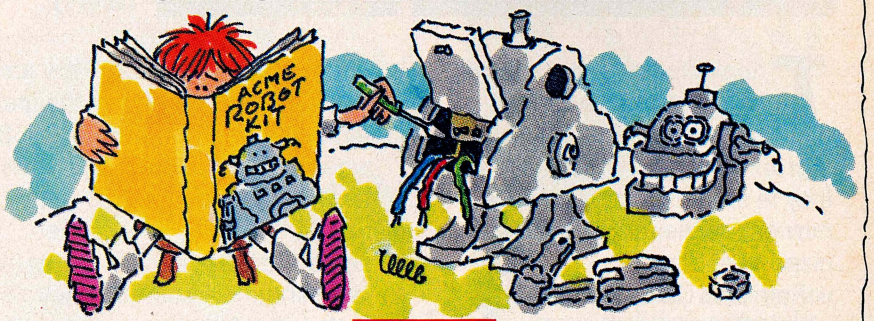
One of the major advantages of the Plus/4 is its greatly improved BASIC. Programming becomes much easier (and faster) than it did on the 64. For those Commodore owners who have wondered how to simply draw a line without fooling around with PEEKs and POKEs, Commodore has added four new commands. CIRCLE, LINE, BOX, and PAINT do exactly what their names suggest. For example, you can draw circles of any size, shape or color anywhere on the screen with only a simple command like CIRCLE.

Commodore is calling the Plus/4 a "productivity machine." It is really aimed at users who need this computer's four built-in business programs—a word processor, money manager, chart maker, and file manager. With these programs, you can keep a budget, run a small business, write letters, print charts and graphs, and more.

All in all, the plus part of the Plus/4 is its built-in BASIC and business software. The minus is its reduced ability as a game player and music-maker compared to the C-64.

A final note: Commodore is also releasing another new machine—the C-16. This computer will replace the VIC-20. It will feature the same BASIC as the Plus/4, have a 16K memory, and a price tag around $100.

HOW TO MAKE FRIENDS ON OTHER PLANETS



First, go to another planet. (That's easy if you're traveling through space in PLANETFALL,™ the great science fiction comedy from Infocom's interactive fiction line.)

Next, find a robot nobody's using. Then, to make him start up, type in your command: TURN ON THE MULTIPLE PURPOSE ROBOT... You've just made a robot friend who'll follow you anywhere.

And you'll be glad you have a faithful follower—there's no telling what will happen next in PLANETFALL. Because, like all of Infocom's interactive fiction, PLANETFALL's designed so that whatever *you* choose to do affects what will happen next. And there'll be plenty happening—it's an adventure filled with everything from dread diseases to mutant monsters, and it can last for weeks or even months.

Get the closest thing on a disk to really going into outer space. Get PLANETFALL*. It's not just a great adventure—it's a great way to make friends!

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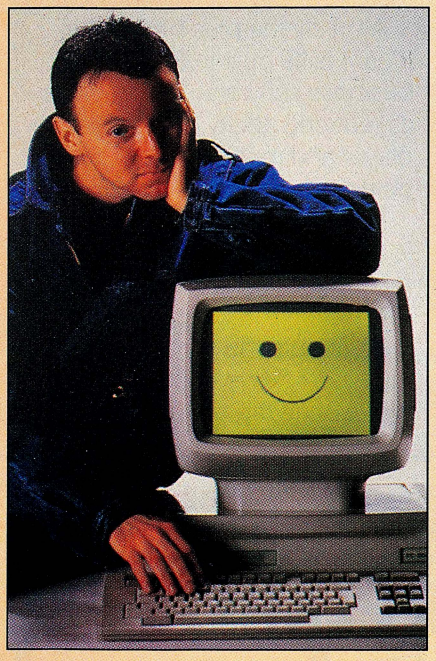
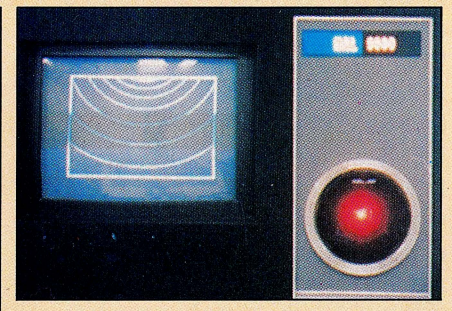
EDITED BY PATRICIA BERRY

WHO SAID THAT?

THE ACTORS WHO MAKE MOVIE COMPUTERS TALK





Far left: *Dreams'* Bud Cort discovers the importance of being Edgar. Left: Douglas Rain returns to the HAL of fame (above).

Thanks to computers, **Douglas Rain** and **Bud Cort** aren't being chased by autograph seekers. Even though they're stars of important new movies, neither actor is recognized very often.

Rain and Cort, you see, *are* computers—or rather, play them—in the movies ***2010*** and ***Electric Dreams.*** Rain, a Canadian stage actor, is the voice of **HAL,** the famous computer villain of *2001* and its sequel, *2010.* Cort is the voice of **Edgar,** the fun-loving computer in *Electric Dreams.*

Both actors learned early that their parts required more than voice changes. But the similarities stop there.

Rain's calm, quiet tones as HAL ("Good morning, Dave. How are you feeling?") made him the first famous movie computer in 1968, when *2001* appeared. Originally, he wasn't supposed to play the computer at all. He had been signed to narrate *2001.* But at the last minute, Director **Stanley Kubrick** asked him to replace the actor who had been playing HAL. Rain had to learn a few "how to play a computer" lessons as he went along.

HAL Lesson #1: Computers shouldn't show emotion.

Director Kubrick "felt the voice (of the first HAL actor) was too emotional," Rain remembers. "For a several-year mission to Jupiter, you want something with a calming effect," he adds.

HAL Lesson #2: Don't act. (At least, don't go overboard.)

"Kubrick sat right next to me in the studio, reading the other actor's parts," Rain recalls. "My mouth was three inches from the mike. I used a very little voice and no projection."

HAL Lesson #3: Computer voices don't change.

When it came time to make *2010,* HAL had to have precisely the same voice as in *2001,* made 16 years earlier. Rain had to carefully listen to tapes of his own voice from the original movie for several days before recording the new lines.

In both movies, Douglas Rain taped his whole part in about two hours. Thus,

HAL Lesson #4: Be quick about it.

Rain was in and out of the recording studio before the other actors in *2010* were even on the set.

HAL Lesson #5: A computer doesn't have to be male to be heard.

2010 introduces **SAL,** a computer more advanced than HAL...and with a female voice.

Of course, there's more than one way to play a computer. Bud Cort's experience in *Electric Dreams* was completely different from what Rain went through.

In *Electric Dreams,* Cort plays Edgar, a not-so-run-of-the-mill home computer. Cort, who starred in the 1971 movie ***Harold and Maude,*** shocked his fellow actors on *Electric Dreams.* He arrived on the set with a crewcut and his light brown hair dyed black.

PHOTOS: (HAL) © MGM/UA ENTERTAINMENT CO. (RAIN) COURTESY OF CANADIAN BROADCASTING CO. (CORT) © MGM/UA ENTERTAINMENT CO.

"Even though no one was going to see me on screen," says Cort, "I had to act as if I were in front of the camera. I was asked not to speak to me, because [the director] wanted the other actors to believe in their characters. I got really angry after a while, but Edgar gets angry too, so it helped with the part."

Even if they don't get star treatment, Rain and Cort were rewarded for their unusual roles

HIDDEN HACKERS: Everyone knows musician **Herbie Hancock** is a computer fanatic. But can you name these other two computer-loving rock musicians? 1. He's the bass guitarist in the world's most famous rock band. He's also a [illegible] who is talking with [illegible] their

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Next, type in your command: BLOW UP THE RUBBER RAFT WITH THE AIR PUMP... But watch it, or you might just blow up the raft until you blow yourself to smithereens!

There's no telling what will happen next in ZORK I—because, like all of Infocom's interactive fiction, ZORK's

[illegible] that whatever *you* [illegible] do makes the next [illegible] open. And you won't [illegible] things to do, either. [illegible] underground empire of [illegible] so huge, your adven- [illegible] last for weeks or [illegible]

So if you want the closest thing on a disk to really exploring an underground world, get ZORK I*. But brace yourself for the action—it'll blow you away!

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EDITED BY PATRICIA BERRY

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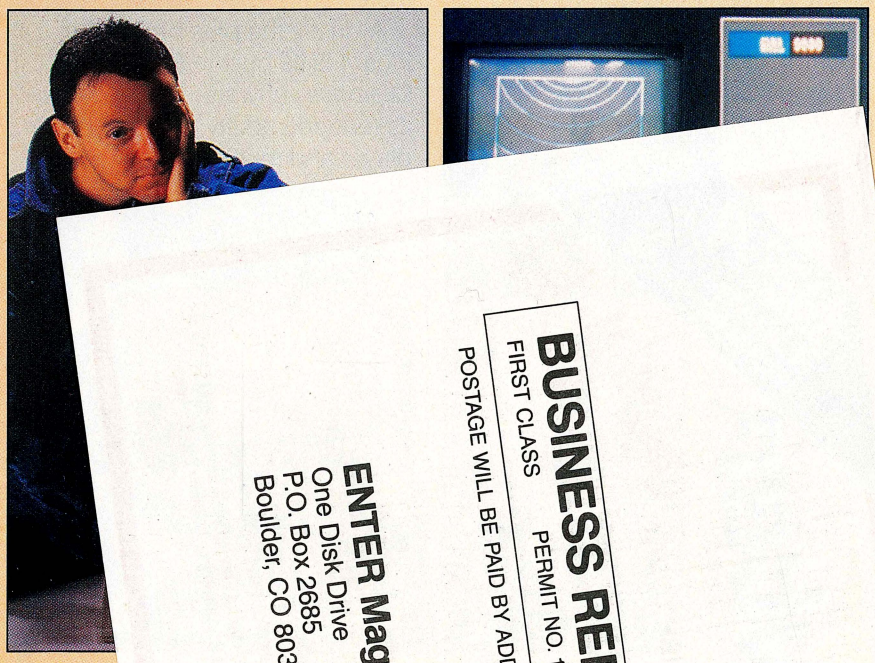

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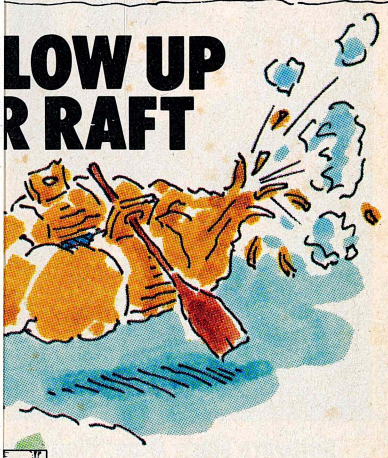
ANS: 1. Bill Wyman of the Rolling Stones; 2. Todd Rundgren, software artist and lead singer of Utopia

BLOW UP YOUR RAFT



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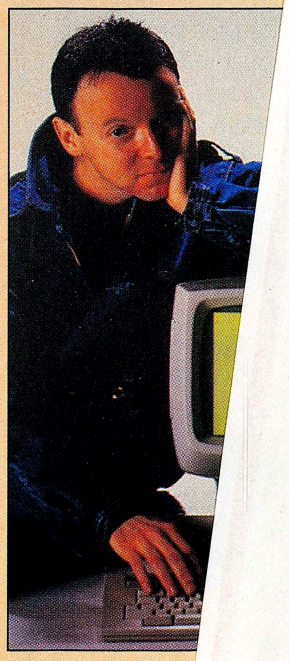

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"Even though no one was going to see me on screen," says Cort, "I knew I wanted to *feel* like something futuristic."

Unlike HAL, Edgar's not what you'd call a calming influence. "Edgar's like a puppy, a very, trusting innocent kind of critter," says Cort. Edgar's owner programs the micro to win the heart of the girl upstairs. But "the more [Edgar] gets programmed by Miles, the more greedy he becomes," Cort adds. "When he gets mad, Edgar cancels Miles's credit cards, locks him in the house, and steals his girlfriend... with love songs."

As it turns out, the computer is a "hopeless romantic," says Cort. "He's gaga for this girl."

Cort first experimented with computer voices when he was up for the computer role in the 1977 film, ***Demon Seed.*** He didn't get the part, but "I always had the character bubbling around in my brain." The character of Edgar, he says "is a combination of people, including my two-year-old-niece and two of my friends....I *became* a computer. I programmed myself with a lot of different ideas, and out came Edgar."

Just as Edgar is different from HAL, Cort's work schedule was different from Douglas Rain's. While Rain taped his speeches in one short sitting, Bud Cort was on the set every day doing live takes.

"They put me in a telephone-type booth with a tiny window and a video screen to watch the other actors," says Cort. "They were asked not to speak to me, because [the director] wanted the other actors to believe in their characters. I got really angry after a while, but Edgar gets angry too, so it helped with the part."

Even if they don't get star treatment, Rain and Cort were rewarded for their unusual roles.

Douglas Rain played HAL so well, he's been asked to take other computer roles. The most famous, probably, was the voice of **K.I.T.T.,** the computer car in the hit TV show ***Knight Rider.*** He's turned down these roles, though, saying he wants "to stay faithful to the original."

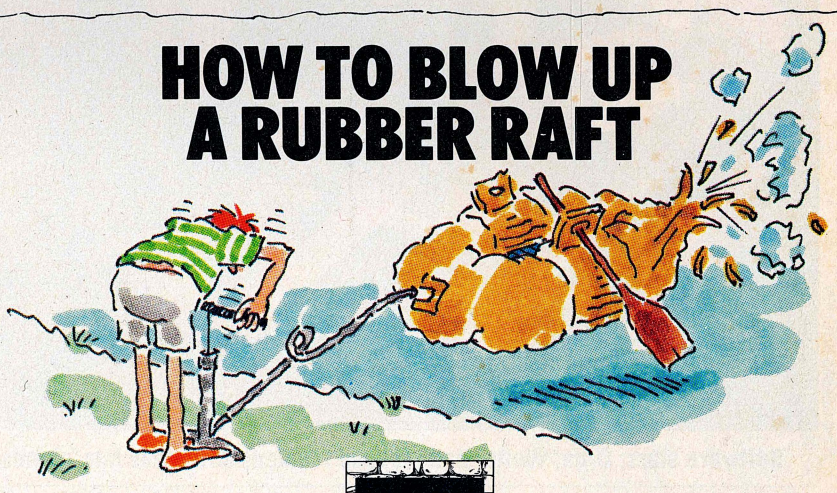
And while working on *Electric Dreams,* Bud Cort had an unusual visitor. "Boy George [who helped make the movie's soundtrack] came and tapped on my booth," says Cort. "He was the only one to come visit me. I was surprised... he was *so* tall."

EDGAR LESSON #1: Playing a computer brings the stars to you!

HIDDEN HACKERS: Everyone knows musician **Herbie Hancock** is a computer fanatic. But can you name these other two computer-loving rock musicians? 1. He's the bass guitarist in the world's most famous rock band. He's also a computer nut who is talking with Wang about promoting their computers. Who is he? 2. He's a singer/songwriter and one of the first people to create music videos. He even created a graphics tablet. Another hint: He likes to "bang the drum all day." What's his name?

ANS: 1. Bill Wyman of the Rolling Stones; 2. Todd Rundgren, solo artist and lead singer of Utopia.

HOW TO BLOW UP A RUBBER RAFT



First, you need a reason to use a rubber raft. (That's a snap if you've got ZORK® I, the classic fantasy story from Infocom's interactive fiction line. Because you'll be hunting twenty fabulous treasures while dodging every kind of evil under the earth.)

Next, type in your command: BLOW UP THE RUBBER RAFT WITH THE AIR PUMP... But watch it, or you might just blow up the raft until you blow yourself to smithereens!

There's no telling what will happen next in ZORK I—because, like all of Infocom's interactive fiction, ZORK's designed so that whatever *you* choose to do makes the next thing happen. And you won't run out of things to do, either. The underground empire of ZORK is so huge, your adventure can last for weeks or even months.

So if you want the closest thing on a disk to really exploring an underground world, get ZORK I*. But brace yourself for the action—it'll blow you away!

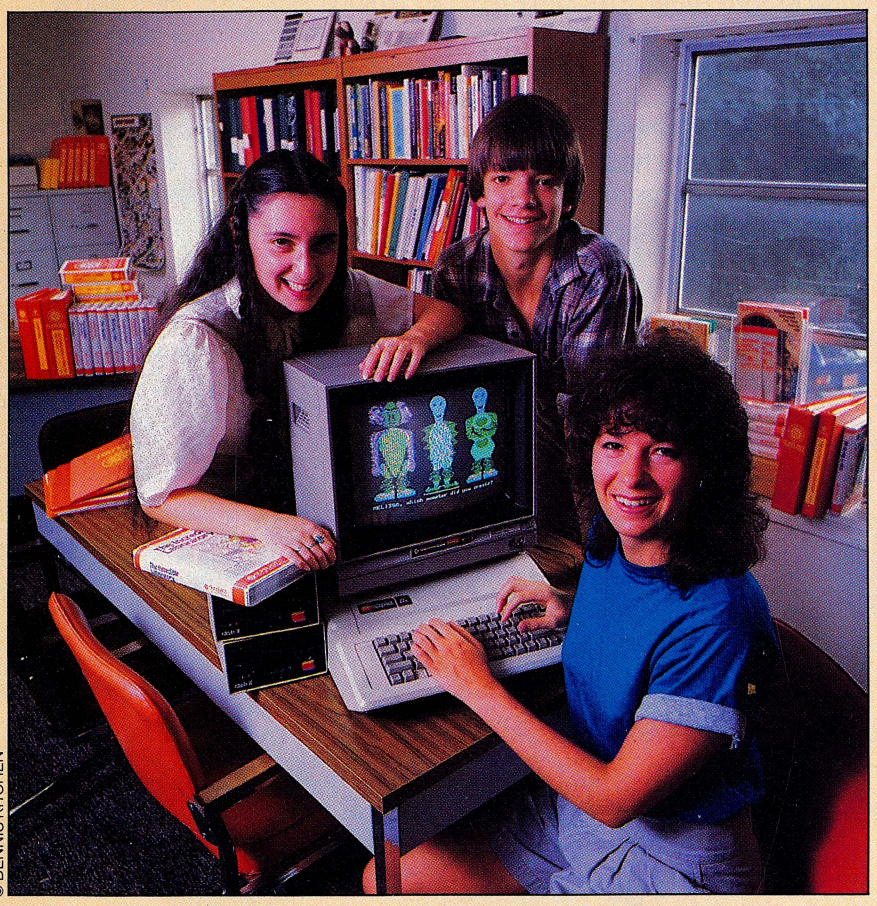
INFOCOM™

*It's compatible with almost every popular home computer. ZORK is a registered trademark of Infocom, Inc.

PACESETTERS

EDITED BY ELIZABETH HETTICH

MOONLIGHTING AT SUNBURST



© DENNIS KITCHEN

Software stars: Olga, Walter and Melissa (seated) turn ideas into games.

M-ss-ng L-nks. Incredible Laboratory. Teasers by Tobbs. King's Rule. What do these computer games have in common, besides being made by Sunburst Software of Pleasantville, New York?

Kids.

All of these games were designed, developed and written by young people. Most of the 15 software developers at Sunburst are under 25 years old, and each plays a different role in turning ideas into software.

Melissa Verber, 22, creates graphics. "I'm not a programmer," she admits. "I do the artwork for a game and then a programmer takes what I've done and fits it into the program."

Olga Mirkim does both graphics *and* programming. *King's Rule* is one game that 19-year-old Olga helped develop from start to finish.

Walter Koetke who taught himself programming, started working at Sunburst when he was 13. Today, at 16, he is still the youngest programmer there. His specialty is converting games, generally written for Apple and Atari computers, to the TRS-80.

None of these young software developers had any formal computer training before they came to Sunburst. They picked up tricks of the computer trade on the job.

"I learned what I know by doing the programs here," says Olga. "The atmosphere is easy-going and you're given a lot of freedom to have fun with your work."

"It's a place you can grow in," agrees Melissa. "I was hired to make copies of software. When I expressed an interest in art, I was given a chance to show what I could do."

There's a reason so many young people work at Sunburst, according to Tom Prosen, director of programming: "We hire a lot of young people because they're energetic and creative. They seem to know both how to program and how to be creative."

Exactly how do Melissa, Walter and Olga contribute to the creation of a finished game?

First, there's the planning stage—when everyone involved in creating the software gets together and kicks around ideas. This gathering includes the person who came up with the idea for the game, the programmer, a graphics designer (who may also be a programmer), and a developer, who oversees the entire process.

During the planning meeting, explains Olga, "we talk about what the game is supposed to look like, what age it's for, and what it should do." Once these details are decided, each person works individually on an aspect of the program.

Melissa's job is to create the characters, scenery and background that appear in a program. "Graphics are a major part of any program—they have to look nice and, since we do lots of educational work, they should also mean something." Once Melissa has created the graphics, they get incorporated into a program. That's where Olga's expertise comes in.

"We program in BASIC," says Olga. "I take the concepts and ideas for a game and program them. It's like solving lots of problems."

When the game is finished, it's up to Walter to adapt it for the TRS-80. "I take the program and do 90 percent of the work converting it to the TRS-80 in two weeks. Then I spend the next month making little corrections and adding finishing touches," says Walter. "By the time I've finished a program, I'm glad to get rid of it." Melissa agrees that working long and hard on a program gets tiresome. But, she admits, there is a reward: "After some time goes by, you see the program in a store—it's exciting."

Melissa says she may make her career as a computer graphics artist. But Walter and Olga have other ideas about what they want to do next. Olga has her eyes on space. And Walter likes sports and writing. Still, he admits, "It will always be nice to have computers to fall back on. I'm not apt to make a living in those fields."

Ed's Board

Edward Svoboda, Jr., 15, runs the largest computer bulletin board in California. Ed's board, called SiMMS (Silicon Multiple Message System) operates out of his home in Cupertino, California.

SiMMs went on-line a little over two years ago. Today, it has about 250 active members, making it not only California's biggest, but also the third largest board in the United States.

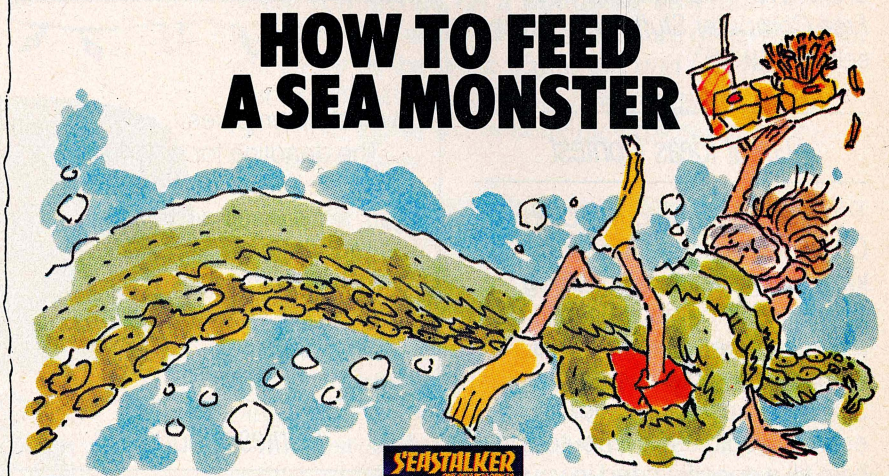
Before starting his board, Ed used his computer and modem to hook into other bulletin boards and on-line services. "Then one day," he recalls, "I came across some information on how to start your own bulletin board. I decided to try." By leaving messages about SiMMs on other boards, Ed was able to build up a strong membership. Now, during the course of an average week, Ed's board may have as many as 100 messages and programs left by users.

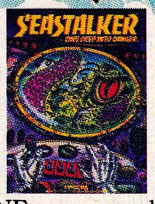
"People leave programs, tell jokes or exchange information. I see all the messages. That's one of the neat things about running the system myself. I know exactly what's there and who's using it" he says.

Starting and monitoring an on-line bulletin board takes time, but it is easy to do, says Ed. If you're interested, Ed can be contacted via modem at: 408-732-9190.

But don't forget: it will cost money to make the call.

HOW TO FEED A SEA MONSTER





First, locate a sea monster. (The best place to find one is in SEASTALKER,™ the brand-new undersea story from Infocom's interactive fiction line.)

Next, type in your command: GET OUT OF THE SUBMARINE AND FEED THE CATALYST CAPSULE TO THE MONSTER. Then, swim for your life! Because the trouble with feeding sea monsters is, the monster might decide to feed on you!

There's no telling what will happen next in SEASTALKER. Because, like all of Infocom's interactive fiction, SEASTALKER's designed so that what happens next depends on what *you* decide to do. And you'll be doing plenty, too—your voyage can last for weeks or even months.

So get the closest thing on a disk to going on a real-life sea adventure. Sink your teeth into SEASTALKER*. But when you do—watch out!—or you might just find out somebody has a sweet tooth for you!

INFOCOM™

*It's compatible with almost every popular home computer. SEASTALKER is a trademark of Infocom, Inc.

CONNECTIONS

EDITED BY SUSAN JARRELL

Almost Free Gifts

Almost Free Computer Stuff for Kids (New American Library) is a book worth a look. It's loaded with information on where to find computer-related "stuff"—things to wear, eat, and hang on your wall—for fairly low prices. You'll also find tips on where to buy more practical items (like books and software), plus information on computer clubs and bulletin boards.

Not everything listed in the book is free or even "almost free." But nearly every item is available for under $10—including *Almost Free Computer Stuff* itself, which sells for $9.95.

Great Ideas Contest

The "Apple Computer Club Competition" is looking for kids with great ideas for using computers. You don't have to be a programmer, or even own a computer, to enter the contest. Just write up your idea for a project that would use computers to help fill a specific need in your school, club or community. For example, a class of school kids in Niskayuna, New York, won last year for suggesting starting a database of travellers' information for people who are heading to airports.

Prizes will be awarded to both individual and club projects. The outstanding entries have a chance to win up to $1,000 and an all-expense-paid trip to the official award ceremonies.

The deadline for entering is March 1, 1985. For more information, send a self-addressed, stamped envelope to:

Apple Computer Clubs, 217 Jackson St., Lowell, Massachusetts 01852.

Contest Round-Up

If you're feeling lucky, you'll want to enter two contests this month. Both are drawings—you don't have to do anything but enter to win.

Both contests have computer-related prizes.

Want a F.R.E.D or Topo robot? In the contest sponsored by The Learning Company—in honor of their new software package, *Robot Odyssey I*—those are the prizes.

All you do is send your name, address, and the phrase "Robot Odyssey I Sweepstakes" on a postcard, to: The Learning Company, 545e Middlefield Rd., Menlo Park, CA 94025. The deadline is December 31, 1984.

Maybe you'd rather win a complete Commodore 64 system? Then check out the Bantam Books contest. The publishers of the *Bytes Brothers*™ series are giving away a C-64, complete with monitor, disk drive, modem and printer.

All entry forms are available at *Bytes Brothers* displays in book and department stores. Winners will be selected at random.

Winning Software

Here's a chance for Apple owners to get three educational games for only $3.50. The winning games in Verbatim Corp.'s "First International Computer EdGame Challenge" are now available on disk for Apple computers. The games—*Dr. Oz's Cavern, Spell-Off* and *Inchworm*—test math, spelling and language skills (there's even a lesson in Japanese!).

Send a check or money order for $3.50 to: Verbatim "Computer EdGame Challenge," Suite 28, 49662 El Camino Real, Los Altos, CA 94022.

—Compiled by Jessica Wolfe

To list news, resources, or contests in this column, write to: "Connections," ENTER, 1 Lincoln Plaza, New York, NY 10023.

Q: What does every kid and parent want?

A: Exciting computer software and fascinating reading.

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GROLIER ELECTRONIC PUBLISHING INC.
WEATHER BULLETIN!
Hurricane coming in 400 hours!
Press SPACEBAR to continue.
SCIENCE FACTS YOU WON'T BELIEVE
WILLIAM P. GOTTLIEB

That's exactly what Grolier—famous in every school and home for its *Encyclopedia Americana* and *The New Book of Knowledge Encyclopedia*—is announcing. Two exciting educational computer adventures that combine software with books.

A fun new way to learn about science!

In Grolier's **Secrets of Science Island**,™ you've been shipwrecked on an island with the hurricane season approaching. To build a shelter, you'll travel around the magical, troll-infested island answering science questions, using a book chock-full of amazing facts: *Science Facts You Won't Believe* (included with the software—the book will amaze adults too).

Geography and history come alive!

Treasure Hunter™ takes you and your pilot-guide, Baron von Riches, on a worldwide adventure in search of the pieces of a lost treasure map. For help, you'll turn to the book, *Explorers and Discovery* (included with the software), as you join in with the whole family in challenging explorations for fascinating facts.

Secrets of Science Island and **Treasure Hunter**—a great new way for parents and kids alike to learn science, geography, and history and to develop valuable reference skills.

Both programs are available **now** for the entire Apple® *II* Family and include activity books. Developed by Intentional Educations (co-developers of the best-selling **Bank Street Writer**™) and published by Grolier as the first of its new **Adventures in Knowledge Series.**™

See your computer software dealer today, or call to order by phone, Grolier Electronic Publishing, Inc. Toll Free (800) 858-8885.

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'DUNE' &

COMPUTERS ARE HEROES AND OUTLAWS IN THIS DIGITAL DOUBLE FEATURE

BY PATRICIA E. BERRY

Warning! The next movie you see may challenge everything you have come to believe about computers.

Coming soon, two science fiction blockbusters—*Dune* and *2010*—are virtually guaranteed to change the way you think about Apples, Ataris and the way we use computers. In both these films, "thinking machines" play a new kind of role.

If you like computers, you may not like what you see.

SANDWORMS AND STING

Dune hurtles you 10,000 years into the future onto the desert planet Arrakis—also called "Dune." Enormous man-eating sandworms threaten every living creature. The sole resource is a spice mined from the sand. Water is so very scarce it is used as money.

Enter the young hero, Paul Atreides, played by newcomer Kyle MacLachlan. Paul must battle the giant sandworms, a Harkonnen invasion, and a very familiar-looking enemy named Feyd-Rautha. Even with his hair dyed orange and his group The Police nowhere in sight,

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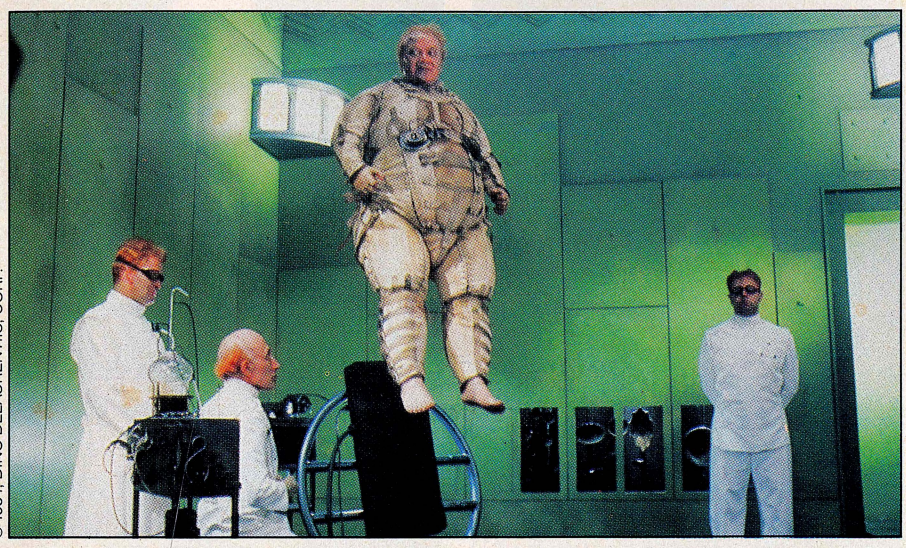
Feyd-Rautha (left) attempts to sting* Dune *hero Paul Atreides.

To regain control of Dune, the Fremen must conquer Harkonnen invaders. Here,

'2010'



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Baron Harkonnen flies in rage over his loss of power to Duke Atreides.

© DIRCK HALSTEAD/GAMMA LIAISON

the invaders cross the planet, suited up for desert travel...and war.

On Dune, Mentats are people who are trained from birth to be 'human computers.'

you'll recognize Feyd-Rautha as the rock star, Sting.

LIFE WITHOUT COMPUTERS

Although *Dune* takes Sting and the rest of us into the distant future, *don't* expect to find computers on Arrakis. In this sci-fi future, computers have been outlawed.

During the planet's Great Revolt, rebels "destroyed the object they thought was evil," says Frank Herbert, who wrote the book *Dune* in 1965. Computers were abolished on Dune because people were afraid of them. "Of course," explains Herbert, who was a consultant on the film, "it isn't the machinery that's evil. It's the people who are using it."

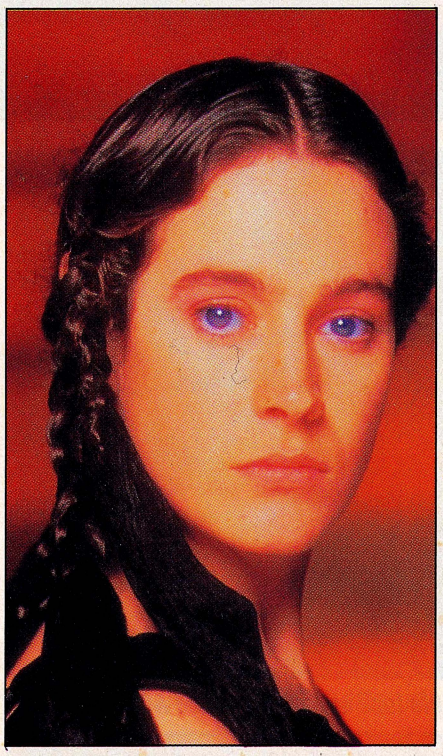
Computers on Arrakis have been replaced by Mentats, human beings trained from birth to perform calculations and provide data with "cold, clear logic."

Even though computers are banished in *Dune*, Frank Herbert doesn't believe they are evil. However, he admits that the fear of computers on Arrakis has its roots here on Earth. In terms of computers, says Herbert, we Earthlings have made some real errors in judgment during the last 20 years.

"Our first mistake back in the '60s was applying [human-like]

'DUNE' &

Dune's hero battles gigantic sandworms and a villain with a familiar face.



Chani's blue eyes are a Fremen trait.

Can Paul return Dune to its natives?

names to computer capabilities," he says. "Computers don't think. They *simulate* thinking. They don't have memories. They have *storage systems*. It's *people* who do all the thinking. You don't blame the ax for chopping down the forest."

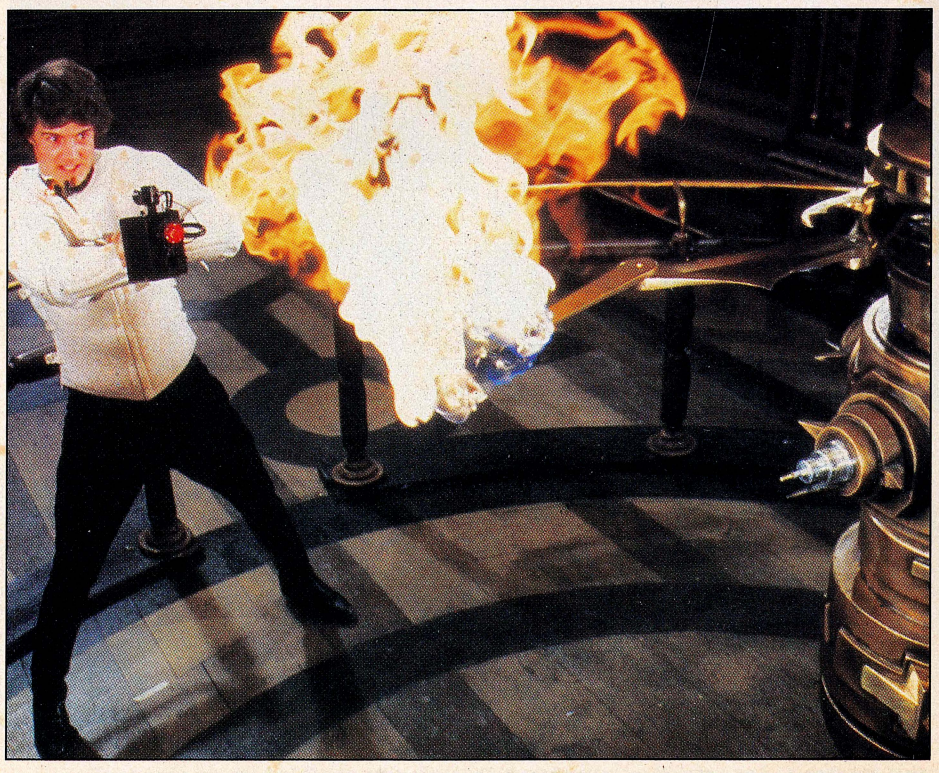
THE HUMAN ELEMENT

In the original *Dune*, and in the sequels he has written since, Herbert has "concentrated more on people than machines.

"What I'm trying to say in *Dune* is that human capacity [goes way beyond] computers," he explains. "Motivation, for instance, is a human ability. Computers don't have motivation."

Unfortunately, Herbert continues, people are motivated to misuse their abilities for evil purposes. That's something computers can't do without the human element. "Positions of power," he adds, sadly, "tend to attract people who are corruptible."

When *Dune* first appeared in 1965, there weren't many computers for people to corrupt. Computers were still a curiosity to most people. However, the "computer revolution" of the past few years has not surprised Frank Herbert. As he explains: "Science fiction writers are experienced at



Computers are outlaws, but robots are allowed to train warriors for combat.

So now you own a computer.

CBS Software can show you how to get the best out of it...

How to get from Sesame St.

CBS Software can help your whole family go faster and further along the road to success. Whether you have an Apple,® Atari® Commodore 64™ or IBM® computer, we have programs to fit your needs. Programs that'll help you every step of the way because they're specially designed by leaders in their fields.

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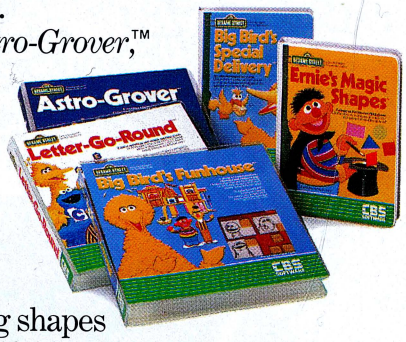
Kids will love teaming up with friends from the SESAME STREET™ gang in our programs developed by Children's Television Workshop (which also created The Electric Company and 3-2-1 Contact).

With *Big Bird's Funhouse*™ and *Astro-Grover*,™ kids work on beginning number skills. *Sesame Street Letter-Go-Round*™ gives them practice in early reading. And, thanks to the exclusive *EasyKey*™ keyboard overlay, kids can enjoy these three programs without any previous computer experience.



For practice in matching shapes and classifying objects, they'll love *Ernie's Magic Shapes*™ and *Big Bird's Special Delivery*.™ Everywhere you turn on this street, you'll hear the joy and laughter of children.

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to Wall St.

You've finished school. And you've made it all the way to a tough management job. But there's still plenty to learn. For instance, how to manage people, your own time and your career even better.

CBS Software can help with our *Managing for Success*™ series, developed by Thoughtware,® leaders in computer-based management training.

Personal Development and *People Management* help pinpoint your strengths and teach you effective leadership strategies. *Delegation, Time & Tasks; Problem Solving, Stress & Conflict* and *Career Planning* help you make the most of your time, both now and down the road. All five programs can help you improve any organization – even families!

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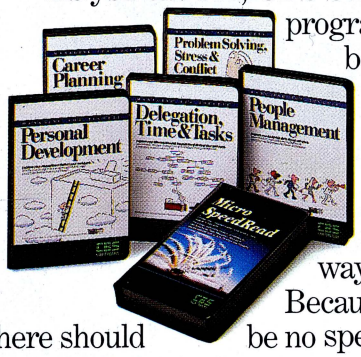
As you can see, CBS Software programs inspire both children and adults to advance as fast as they want. And that's just the way we planned it. Because we believe there should be no speed limits between Sesame Street and Wall Street.



CBS SOFTWARE

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How to care for a Tyrannosaurus.

What would you feed a dinosaur for lunch? Would it eat the sofa? Would it eat you?

Dinosaur Dig™ answers all your questions about these fascinating creatures. It's easy with the exclusive *EasyKey*™ keyboard overlay that simplifies the computer keyboard. And it's tons of fun!

Other CBS Software programs give you even more to explore.

In *T. rex*,™ you actually become Tyrannosaurus rex – the most ferocious of all dinosaurs – and struggle for survival.

With *The Honey Factory*,™ you can build your own beehive and experience the interactions within this miniature society.

Forecast!™ lets you reach new heights by making your own weather predictions. *America Coast-to-Coast*,™ on the other hand, is a more down-to-earth experience. It's a stimulating way to learn fascinating facts about our 50 states.

And if these programs aren't enough, then create your own. You can do that with *Adventure Master*,™ by masterminding your own computer adventure games.

From the Stone Age to the Computer Age with CBS Software. Now that's progress!

America Coast-to-Coast and *Dinosaur Dig* feature our *EasyKey* keyboard overlay.

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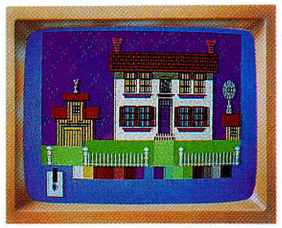
How to build a house with your own two fingers.



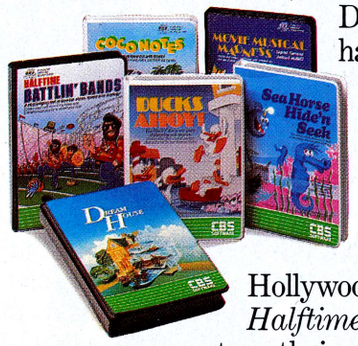
Kids can learn to build some very basic skills with some very basic tools. Their fingers.

With *Dream House*,™ children can just press a key to call up a floor plan and decorate and furnish the model home of their choice. Victorian, Modern, Colonial...whatever!

Other CBS Software programs help them build a sense of timing and learn about color and size relationships.

In *Ducks Ahoy!*,™ young kids travel through the canals of Venice and help some wacky ducks avoid the big hippo. In *Sea Horse Hide 'N Seek*,™ they must camouflage themselves to avoid the hazards of the reef.

For those with a more musical direction, the award-winning Dovetail Group has created *Movie Musical Madness*.™ Aspiring actors and musicians can write, compose and direct their own Hollywood musical. Or with *Halftime Battlin' Bands*,™ they can stage their own halftime show. And with *Coco-Notes*,™ they'll go fishing for notes to build their own melodies.



With CBS Software, kids will have a ball while they're building for their future!

How to master the ABC's of the SAT's.

S-A-T. Three letters that can determine the course of your future.

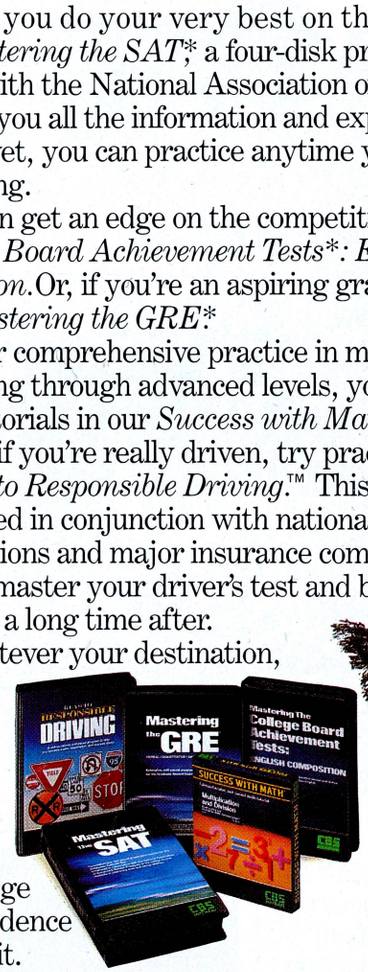
CBS Software can help you do your very best on this all-important college entrance exam. *Mastering the SAT*,* a four-disk program developed in cooperation with the National Association of Secondary School Principals, gives you all the information and explanations a private tutor can. Better yet, you can practice anytime you want and always keep on improving.

Another way you can get an edge on the competition is with our *Mastering the College Board Achievement Tests*: English Composition*. Or, if you're an aspiring grad student, we have *Mastering the GRE*.*

And for comprehensive practice in math skills, from beginning through advanced levels, you'll like the self-paced tutorials in our *Success with Math*™ series.

Finally, if you're really driven, try practicing with our *Keys to Responsible Driving*.™ This program, developed in conjunction with national safety organizations and major insurance companies, will help you master your driver's test and be a better driver for a long time after.

Whatever your destination, CBS Software can help you build your knowledge and confidence to reach it.



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How to create thunder and lightning.

Don't like the weather? Then make your own.

Weather Tamers™ gives you the power to control temperature, moisture and air pressure across the country and simulate tomorrow's weather!

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Fleet Feet™ brings you back to our galaxy in a foot race where your speed of thought is more important than your reflexes.

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CHILDREN'S TELEVISION WORKSHOP

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'2010'

Lady Jessica, Paul's mother, becomes a Fremen spiritual leader.

Feyd teases his Mentat, a man trained from birth to replace computers.

PHOTOS © 1984, DINO DELAURENTIIS CORP.

Fear of computers, common on Arrakis, has roots here on the planet Earth.

looking at trends. I knew computers would become a household item," he continues. "You could see the price coming down....Computers speeded up a lot of things."

As a science fiction writer, Herbert is filled with visions of the future. He is convinced that "computers will affect our lives to a greater extent than the wheel, if not fire."

But will we on Earth end up like Arrakis, where computers are abolished because people believe they are evil? That's something that not even the creator of *Dune* can predict.

THE RETURN OF HAL

While the people on Dune fear and *outlaw* computers, the astronauts in *2010* depend on computers to keep them alive. But fear is never light-years away.

The astronauts in *2010*, the sequel to the 1968 sci-fi classic *2001: A Space Odyssey*, have reason to be nervous. Though shut down for nine years, HAL, a killer computer, is still orbiting Jupiter in the spaceship Discovery.

In the movie *2001*, HAL kills several astronauts and is finally shut down. In *2010*, which is based on a bestselling novel by Arthur C. Clarke, the computer HAL gets

'DUNE' &

'In 2010, you find out why HAL acted the way he did in the 1968 film, 2001.'

a whole new lease on its life.

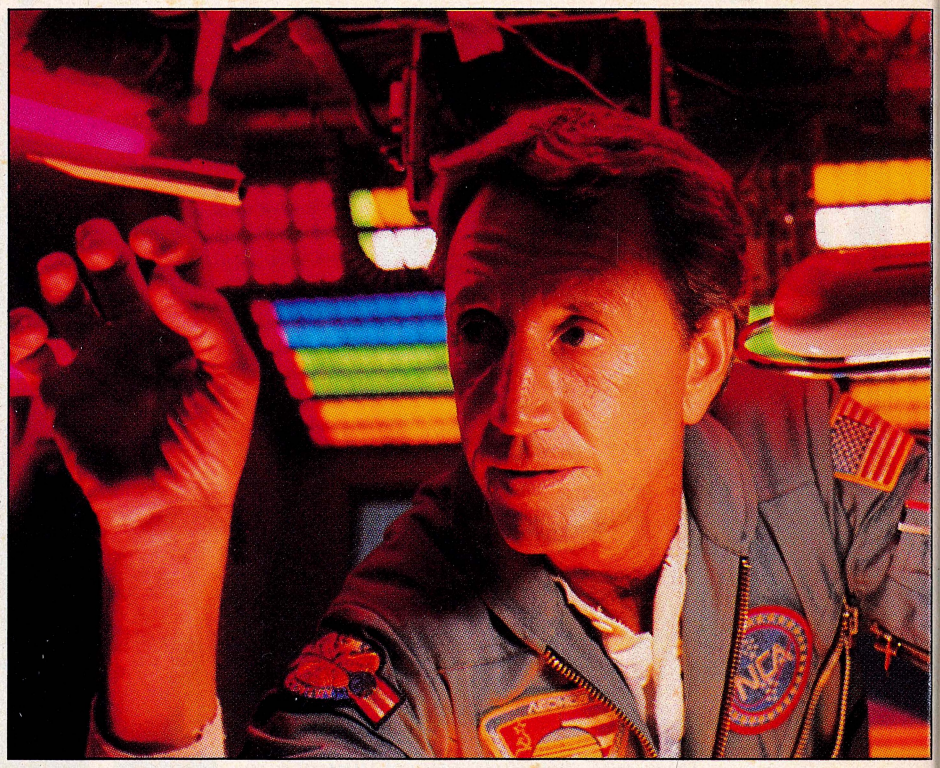
According to director Peter Hyams, *2010* will set the record straight about HAL. In this movie, a Soviet/American space salvaging mission attempts to piece together the events of *2001*. Hyams hopes what they discover will dissolve fears that computers are capable of evil behavior.

HAL's evil reputation, admits Hyams, will be a hard one to clear. For one thing, when the astronauts in *2001* attempted to abort their mission, HAL took over. He then did away with all but one astronaut, David Bowman, on board the spaceship *Discovery*. Completing the mission—even at the expense of human life—seemed to be HAL's top priority.

But HAL is a "maligned character," says Hyams. "He has an enormous responsibility. In *2010* you find out *why* he did what he did in *2001*." The director claims there were good, *humanistic* reasons for his actions.

In fact, Hyams adds, "people shouldn't be too quick to make assumptions about *any* of the characters in *2010*."

Hyams won't give away what happens to HAL at the end of *2010*, but he does offer this hint: "HAL has the survival of the astronauts as his top priority, even at the risk of

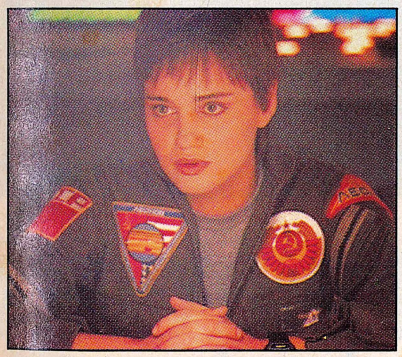


In 2010, a former space agency head (Roy Scheider) is out to clear his name.

U.S. and Russian astronauts work together in 2010 on an investigation near Jupiter.

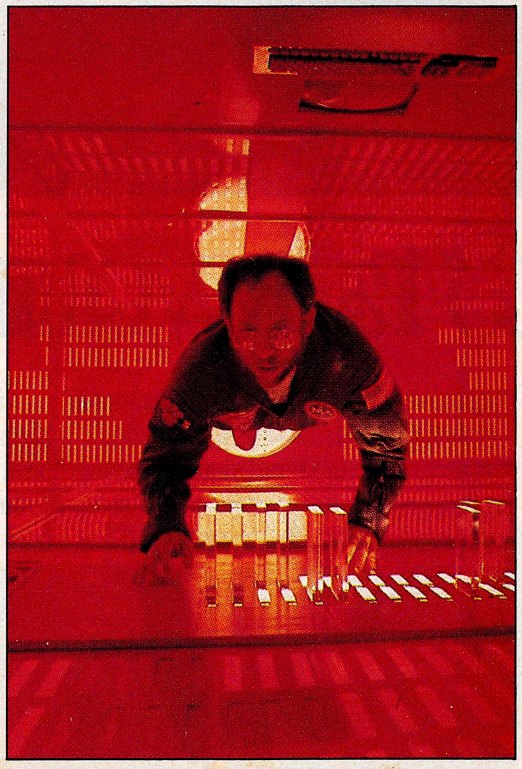
'2010'

HAL "watches" as astronauts aboard the Discovery try to unravel the mystery of 2001.



Russian cosmonaut, Yakunina.

Walter Curnow, reluctant passenger.



HAL's creator inside the computer's memory.

PHOTOS © MGM/UA ENTERTAINMENT CO.

In 2010, a crew of astronauts travel to Jupiter to find the lost ship Discovery.

his own existence."

Why does Peter Hyams believe HAL the computer should be cleared of his evil reputation? Like Frank Herbert, Hyams believes computers have been treated unfairly in real life—at least by adults.

"I think we overrate (computers). They're *not* smart," says Hyams, who blames science fiction books and films for painting unrealistic pictures of evil computers.

"In movies like *Desk Set* (1957) and *2001*, computers seem to only [cause] trouble," he notes. "They represent to us a kind of powerlessness....[In those movies] it was 'us' in the hands of computers."

Now that computers are all around us and no longer a curiosity, we have to forget these ideas. "Like it or not, [computers] are here to stay," says Hyams. "We have to learn to make peace with these machines."

Of course, he adds, "we're less afraid of them now. They're in our homes, and our kids are better at them than we are."

And, Hyams suggests, kids know something about technology that parents still have to learn: "Computers are capable of malfunction, but not malevolence."

PATRICIA E. BERRY is an associate editor of ENTER Magazine.

How to talk your parents

There's a new Apple® Personal Computer called the IIc that's so complete and so affordable that getting your parents to buy one should be easier than learning Logo.

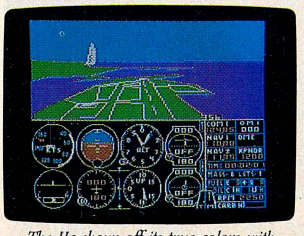
If, that is, you know what to say.

For example, don't tell your parents that the IIc has the first true 128K VLSI motherboard, dual built-in RS-232 ports and a built-in half high disk drive. Or that it has a switchable 80/40 character display and built-in mousetronics so it can use an AppleMouse.

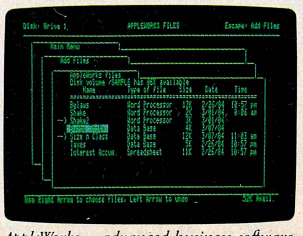
You know that's incredible in an 8 pound* computer, but all those specs may make your parents uncomfortable.

Just tell them that the Apple IIc can run more than 10,000 programs written for the Apple IIe, the most popular computer in education at all levels. And it works just the same as the Apple computers you learn on in school.

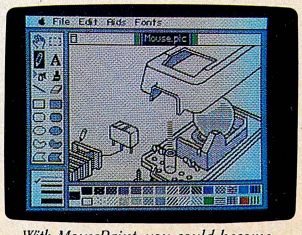
You might also mention that it's a bargain. It comes with everything you need to start computing in one box—including an RF modulator that lets you hook it up to your TV the moment you get it home. There's even a free 4-diskette course on computer basics they



The IIc shows off its true colors with SubLogic's Flight Simulator II.



AppleWorks—advanced business software even a parent could love.



With MousePaint, you could become the next Picasso. Or the next Charles Schulz.

into parting with $1300.

can use when you're too busy to show them how.

All for under $1,300.**

Of course, they probably won't want to hear that it runs more games than any other computer in the world except the Apple IIe.

But they might like to know that it also runs advanced business software. Including specialized programs for every profession from doctoring to farming to astronauting. Not to mention personal productivity software to manage their personal finances and taxes.

Speaking of which, they can deduct part of an Apple IIc's price from their taxes if they use it for business.

Even if they always keep it at home.

Don't confuse them right now with the wide array of Apple IIc accessories and peripherals. Like Apple's 1200/300 modems. Or the IIc's low cost full-color graphics/text printer, Scribe.

The IIc Bag has room for a power pack, software, even notebooks. So it's worth a few extra bucks.

But assure them that your IIc can grow just as fast as you do.

Now, if all of these carefully reasoned arguments fall on deaf parental ears, don't despair. There is still one thing more you can do.

Get a paper route.

** The IIc alone weighs just 7.5 pounds. Power packs, monitors, printers, modems and mice can make it as heavy as you'd like. ** Suggested retail price.* *© 1984 Apple Computer, Inc. Apple and the Apple logo are trademarks of Apple Computer, Inc.* *For an authorized Apple dealer nearest you, call* ***(800) 538-9696.*** *In Canada, call* ***(800) 268-7796*** *or* ***(800) 268-7637.***

'Tis the season to be jolly—and to be thinking about holiday gifts.

As we were making a list (and checking it twice), we noticed something was wrong. We forgot to get a gift for our computer! With all the hardware and software everywhere, we knew it would be rough getting just the right gift. So we decided to ask ENTER readers for help. We called several of you and asked what gift you'd get for your computer.

HOLIDAY

Some of you knew exactly what you'd get, while others dreamed of computer gifts that don't even exist—yet. Here's our ENTER readers' holiday wish list. Maybe it will give you some computer gift ideas.

★ "I'd like to get an Automodem by Automation," says Rob Turknett, 12, from Atlanta, Georgia. "I'd use it to start a users' group and an electronic bulletin board." Rob also had ideas about what his family would like: "For my family I'd like to get the CodeWriter software series. That's software that lets you change programs by typing in what you want in English."

★ "I'd like to get into networking and be able to call up local bulletin boards," says Todd McMullen, 17, from Gaylord, Michigan. So he would like a VICModem for his Commodore.

★ "I'd probably ask for a Koala Pad," says Donna Prague, 14, of Orlando, Florida, who likes doing graphics on her computer. She also thinks the pad, from Koala Technologies, could be useful in other ways: "It would be very helpful for geometry and for having fun."

★ An Apple IIc and printer is on the wish list for Jessica Nolfo of Lakewood, New Jersey. "Then I would get stuff to go along with it, like *Bank Street Writer* and *Facemaker* by Spinnaker."

★ An inexpensive modem—"something you can use with a rotary dial instead of a pushbutton phone"—is on the list for Amy Loch, 13, from Springville, Pennsylvania. Amy also likes programming in Logo and wants a printer to print out her Logo graphics.

★ Networking seemed to be on everybody's mind. Marie Bernard, 14, from Burke Center, Virginia, and Chris Young, 15, from Monroe, Louisiana, both said they would like to get modems so they could start making friends through the bulletin boards. Chris also said "it would be great to get a speech synthesizer." He would love to experiment and find new uses for a talking machine.

★ "Anything I want?" said Rick Aaron, of Montvale, New Jersey. "I'd have to say unlimited software credit. That would my dream—to walk into the computer store and get any software I wanted. Incredible! I'd have to confess, lots of it would be games, but I would also probably like to get a word processing program like Wordstar."

THE COMPUTER GIFTS ENTER READERS WOULD MOST LIKE TO GET

BY JESSICA WOLFE

WISH LIST

★ A mouse—not the cheese-eating kind, but the kind you use to control your computer—was tops on the list for Tim Krakowski, 13, from Wooster, Ohio. "It's really simple to use—anyone, even if you've never touched a computer before, can draw really neat stuff with it." And, if he didn't already have it, Tim would buy *One-on-One,* the basketball computer game from Electronic Arts. "The graphics and animation are fantastic."

★ *Flight Simulator I* and *II* from Sublogic was the most often mentioned software. Russell Reisinger, 14, from Tempe, Arizona, likes flying and says *Flight Simulator* "looks like a really good game."

Robert Jacobson, 13, from Minneapolis, told us he'd "tried *Flight Simulator* out a few times and really liked playing with it." Robert also said he was "really into programming," and would "love to have a Keyport 300—it's a programmable keyboard that lets you design your own keys."

★ A printer for his TRS-80 Color Computer is the choice for Richard Beck IV, 15, of Kissimmee, Florida.

His other holiday wish is for a program called *Worlds in Flight.* "It's like *Flight Simulator,* but it's done in outer space."

★ *CIA* is a utility program that helps retrieve information on crashed disks, and that's something Peter de la Maza, 14, from Irvine, California, likes to do. "It's very useful to have if you do a lot of programming," says Peter, who had his wish come true when he recently got this software.

★ "A better graphics program" is what Ky McPherson, 13, is wishing for. Ky, of Montevallo, Alabama, has been doing graphics on his Apple for two years. But, "we live in a small town, with very little access to computer stores," so he keeps trying to increase the capabilities of his *MicroIllustrator* program.

★ A kid we talked to didn't have a computer, so his choices were pretty obvious.

Matthew Russell, 13, of Colchester, Connecticut, wants an Atari 800XL and a disk drive, as well as a printer and word processing program. It's not just for me, insists Matthew. "The computer would be for my whole family."

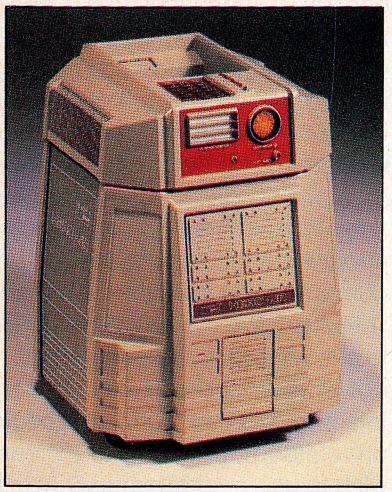
★ Rob Turknett had an idea about what he'd like for his computer. Unfortunately, it doesn't yet exist. "The product I'd really like to see would be something that could read handwriting and translate it so that your computer could understand." Sounds like a great wish to us.

HOLIDAY BUYERS'

ROBOT ROLL

THE LOW-COST, HIGH-FUN LINEUP FOR 1985

BY FRED D'IGNAZIO



HERO Jr. may ask if you're a human.

Robots are wearing ribbons this year.

This isn't a futuristic fashion trend. Those are gift-wrapping ribbons that robots will wear as they become the hottest high-tech gift of 1984.

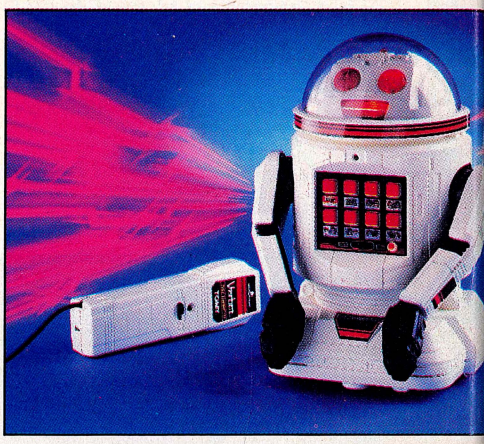
These new low-cost robots (from $4 to $600) can't do chores, but they *do* have some exciting high-tech features. Some are programmable, which means you command them with your computer. Some contain special sensors that let them avoid obstacles or find people. And some just give you an idea of what it's like having a robot around the house. Here's a rundown of the holiday robot lineup.

F.R.E.D.

F.R.E.D., a foot-tall table top robot, is not as versatile as its fellow Androbots, B.O.B. and Topo. But with a recommended price of under $400, it's definitely more affordable. You program F.R.E.D. in Logo with a home computer. It then follows your instructions to the letter. And with a pen held in its rabbit-like paws, F.R.E.D. will draw on paper anything you've created on the computer screen. (Available from Androbot, 101 East Daggett Drive, San Jose, CA 95134.)

TURTLE TOT

Turtle Tot brings the on-screen Logo turtle to life. You program this robot in Logo by hooking it to your home computer. Once Tot has its marching orders, it can roll, turn, and blink its electronic eyes. There's even an optional speech package that lets you program Tot to say some words. (Available for $299 from Harvard Associates, 260 Beacon Street, Somerville, MA 02143.)



Tomy's Ver-bot listens only to you.

MAXX STEELE

Need a robot superhero? Call Maxx Steele, the two-foot-tall leader of Robo-Force.

You guide Maxx through adventures with a radio remote controller. A built-in microprocessor lets Maxx speak 20 pre-programmed phrases. Or you can use its 150-word vocabulary to create your own sentences. Maxx even plays "Moon Ball," a kind of laser ping-pong game. (Available from CBS Toys, $350.)

CALL

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STATE ZIP

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FORMERS & GOBOTS

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AZIO is an ENTER editor.

Maxx Steele talks and plays Moon Ball.

on-board alarm clock. Ver-bot has a voice recognition system that understands eight spoken commands (like "forward" and "stop"). Once you program it to

HOLIDAY BUYERS'

ROBOT ROLL

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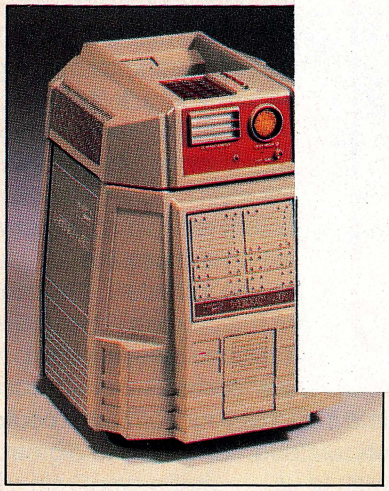
THE LOW-CO
HIGH-FUN
LINEUP FOR 1

BY FRED D'IGN



HERO Jr. may ask if you're a human.

TURTLE TOT

Turtle Tot brings the on-screen Logo turtle to life. You program

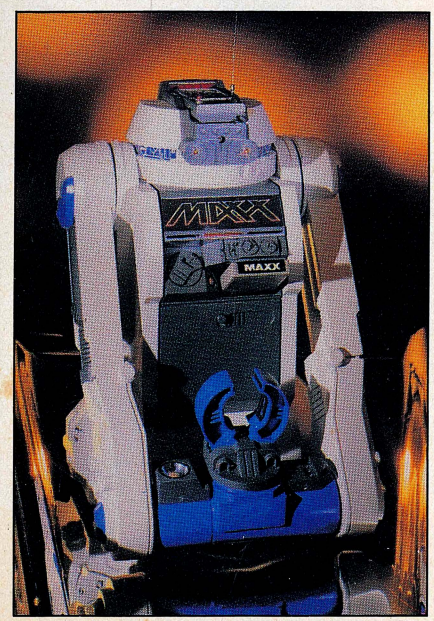
own sentences. Maxx even plays "Moon Ball," a kind of laser ping-pong game. (Available from CBS Toys, $350.)

CALL

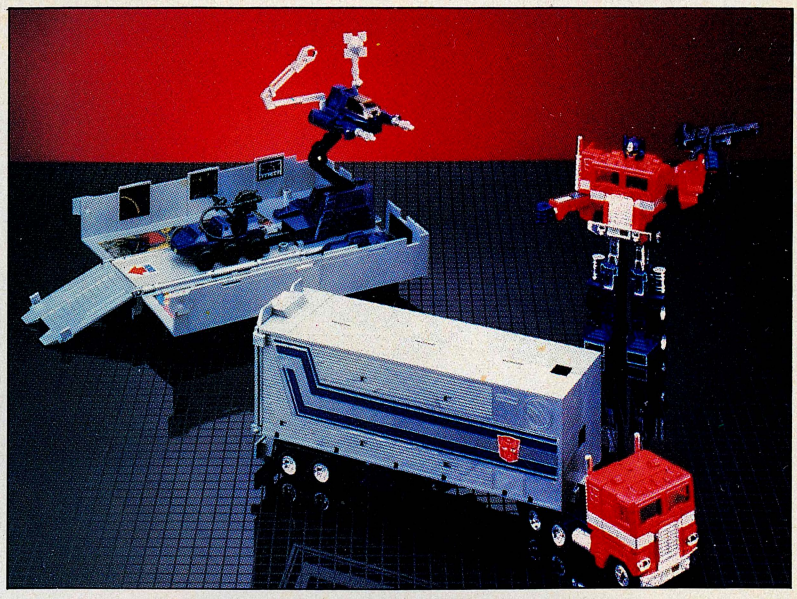
HERO JR.

HERO Jr. is about three feet tall, and looks like R2-D2 with a crew-cut. This robot's personality depends on which preprogrammed cartridge you plug into it. Put a cartridge in, and this robot may sing "Old MacDonald had a robot" or say "Beam me up, Scottie."

HERO Jr. especially likes to look for humans. Its infrared sensor detects moving objects, which HERO Jr. rolls up to and says: "I'm looking for humans. Are you a human being?" It's great fun when HERO Jr. says this to your dog or vacuum cleaner. (Available from Heath/Zenith, Benton Harbor, MI 49022. $1,000 assembled; $600 as a kit.)



Maxx Steele talks and plays Moon Ball.



Hasbro's Transformers : A toy, but still plenty of robot fun.

MOVIT FAMILY

These robots are only a few inches tall, but big-time when it comes to a good time. Each MOVIT robot has a special sensor that you use to control its actions. For instance, Turn Backer bounces along until you blow a whistle. Then its sound sensor signals it to turn back around.

Other MOVIT family robots include: Avoider, whose infrared sensor lets it go around any object that gets in the way, and Monkey, which romps along a rope and responds to clapping hands. (Available from OWI, Inc. $15 to $75 each. NOTE: Assembly, including soldering, is required.)

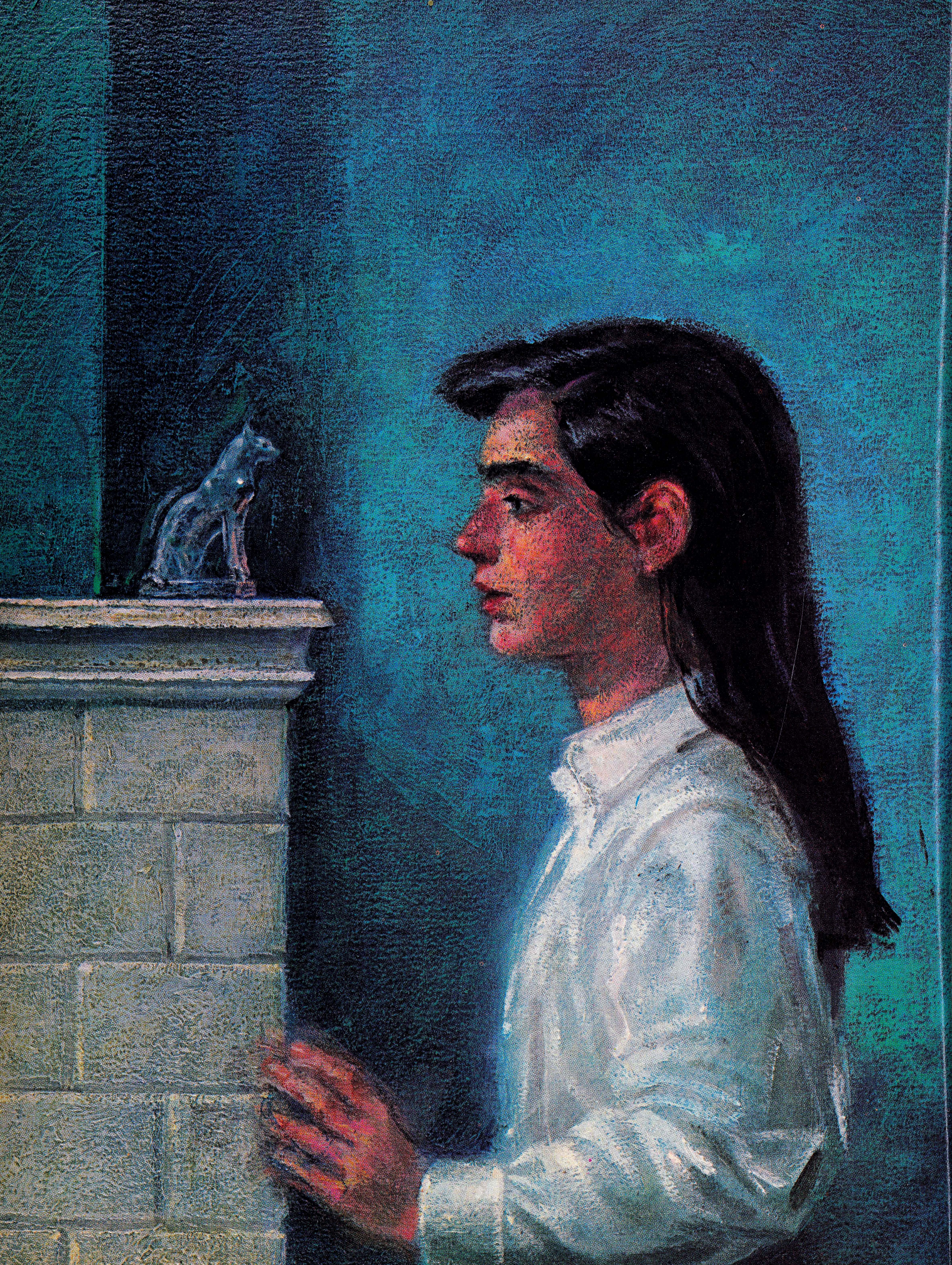
TOMY ROBOTS

These robots have special skills. Omni-bot is a radio-controlled robot that can deliver a tray, recite a poem, or wake you with its on-board alarm clock. Ver-bot has a voice recognition system that understands eight spoken commands (like "forward" and "stop"). Once you program it to obey *your* voice command, Ver-bot obeys only you. Ding-bot bumps into things. If robot antics make you chuckle, Ding-bot may live up to its billing as "the comedian of robots." (Available from Tomy Corp.; $10 for Ding-bot, $65 for Ver-bot and between $250-300 for Omni-bot.)

TRANSFORMERS & GOBOTS

These aren't blinking, romp-around robots like those we've mentioned above. The GoBots and Transformers are non-electronic toys that look like jets or cars or other normal objects. Press a button here, move a wing there, and they turn into robots. GoBots and Transformers can't be programmed and have no sensors, but they're fun to play with. (GoBots from Tonka cost $4-10. Transformers from Hasbro cost $10-25.)

FRED D'IGNAZIO is an ENTER contributing editor.



THE CASE OF THE CRYSTAL CAT

BY DAVID BENSON POWELL

PART ONE

Thud.

Katie Parker didn't even stir. She was asleep, her head resting on her arms in front of Sherlock's still-glowing computer screen. On it was a program she'd been trying to debug all night. It was now well after midnight.

CRASH!

She heard that!

The lights were off throughout the house, but the glow from her computer screen helped Katie make her way into the front hall.

"Lex, you idiot!" a man whispered. "Shhhhh!"

Katie peered into the pitch-black living room. "Who's in there?" she demanded.

"Let's get out of here!" yelled the voice in the darkness.

Katie saw two shadows run into the hall. The back door opened, slammed shut, and footsteps ran down the porch stairs into the misty seaside night.

"Wonder if they stepped in the wet paint," she thought, as her parents ran out of their bedroom.

Thursday was a heavy class day, so Don Farrell didn't get a chance to see Katie till lunch.

"Heard your house was robbed last night," he said. "What happened? Did they get any loot?"

"Some," Katie told her best friend as they squeezed onto two tiny school cafeteria chairs at a crowded table.

"The burglars took all the good silver they could find, and had just pulled out the television cord when one of them knocked over a vase. I woke up, and must have scared them off," she continued.

"Did you see a gun?" Don asked. The kids around them stopped eating.

"No," Katie answered, looking around. "It was too dark. All I saw were shadows."

"What time did it happen?"

"About half past midnight," she replied, then twisted her face into a confused frown. "Strange."

"What?"

"Something they did," she continued. "They ran out in such a hurry, they actually left something behind, a tiny statue—a crystal cat."

"A gift, huh?"

"I guess so. But, I can't understand why the burglars brought it into our house at all. Sheriff Newhouse seemed really interested in it, too. And he wasn't at all surprised to find it in our house."

That evening, the *Winter Harbor Press* devoted one-fourth of its front page to the previous night's robberies.

"Now I understand the sheriff's reaction," Katie told Don on the telephone. "Another house—in the area—was also hit around midnight. The robbers left a 'gift' there, too."

"A cat statue?" Don asked.

"No, an expensive-looking, but worthless, piece of costume jewelry. In a town this size, it can't be coincidence," she said, shaking her head.

"I see what you mean," Don added. "Have there been any other robberies like these two?"

"Not that I know of, but let's check through some old newspapers at the library tomorrow."

The next day, Katie and Don found one other robbery that fit the pattern. It had occurred two weeks earlier. The burglars had left behind an oil painting that *looked* valuable, but wasn't.

"Maybe that was the start of the string," Don observed.

ILLUSTRATIONS © THOMAS WOODRUFF

Katie was way ahead of him. "Which is why Sheriff Newhouse wasn't surprised. The 'gifts' are sort of the burglars' trademark," she said.

When Katie went home, she turned the computer on, picked up the nearby telephone and dialed. Another computer answered. Its voice was a shrill, high-pitched whine. After Katie pushed the receiver into a telephone modem, Sherlock's screen showed what the other computer was saying.

"WELCOME TO THE ALPHA DATA BASE. PLEASE ENTER YOUR PASSWORD."

She typed.

"PASSWORD ACCEPTED. ENTER DESIRED FILE."

She entered "FILE 227:NEWSSEARCH," which gave her access to newspaper articles across the country.

Katie wanted to find out more about these crooks. Were they from Winter Harbor? Had they hit other towns? If so, they were probably mentioned in the other towns' newspapers. The best way to track them down was through their unique habit of leaving gifts behind. Katie entered the words "robbery" and "gift," and the ALPHA computer searched all its newspaper articles for any that contained both of those words.

It found quite a few. The crooks had first struck around Indianapolis. That city's papers ran stories about them for a whole year, then stopped. Next, they hit Chicago. Then, Columbus, Ohio...Pittsburgh... Albany, New York...Springfield, Massachusetts. And now, apparently, Winter Harbor.

"WHAT!" Don exclaimed.

Mr. Drummond, their history teacher, turned from the blackboard, gave Don an icy stare—then resumed chalking up the battle plan for Gettysburg.

"We're going to catch the thieves," Katie repeated in a whisper. "The crystal cat—and all the other 'gifts'—will help us trap them. All we need to do is collect information and let Sherlock sort out the loose ends."

"Lucky us," sighed Don.

Saturday morning, Katie told Don to try to get burglary data from the Sheriff's office. Sergeant Molloy was manning the desk.

Don talked to officer Molloy, explaining Katie's theories. Molloy, grumbling, finally agreed that no harm could come of it giving Don the information--if he kept it confidential. Soon after, Don returned with a complete list of local burglaries: dates, times, objects stolen and any 'gifts' left behind.

"I think the crooks like it here," Katie mumbled.

"Ah yes," Don continued, "the sun, the sea..."

"And, crystal cats...Which they don't want, for some reason," Katie continued.

"Maybe the cat was as worthless as all the other gifts," Don said.

"There's probably some truth to that," Katie agreed. She sat down at her computer and asked Don to read off all the police data—slowly.

As Don read, Katie entered the facts—street addresses, dates, times, property taken—into Sherlock's database-management program. She could then ask questions and receive Sherlock's instant analyses. A few keystrokes, and she learned that objects tended to surface as "gifts" three days after they were stolen.

Beyond that, the data yielded no obvious patterns. Katie leaned back into her chair, crossed her arms and stared at Sherlock's screen. Don knew better than to interrupt. Then, without a word, she ran across the room and picked up a tiny video camera. Don had only seen her use it to transmit pictures of their faces onto Sherlock's screen. He had never known how awful a person could look, till Katie

Crash! "Let's get out of here!" yelled a voice. Katie peered into the pitch-dark and saw two shadows run down the hall.

The computer put Katie and Don hot on the crooks' trail....Before the search, they set their watches and agreed to meet in an hour.

changed the color of his face to purple.

"Don, go see if you can find a town map," she said.

Don returned, with map, to find the camera plugged in and pointed down at the tabletop. Katie opened and flattened the map beneath the camera's lens. A few minutes of keyboard work, and the map appeared on Sherlock's screen.

"Now we can do some real detective work," Katie beamed at Don.

The map still appeared on Sherlock's screen. It reminded Don of the map on Sheriff Newhouse's office wall—now pierced with 20 little colored pins. One pin for each robbery.

"First we'll patch the robbery data into Sherlock's screen display," Katie continued. She marked each crime with a red dot on the computer map, then coded it to the robbery data base.

"Now Sherlock knows as much as we do about the robberies," she said. "The thieves have swept through several towns—without being caught. They have to be very well organized. The only way to stop them is to try and predict where they will hit next, and set up a trap."

She turned back to Sherlock, and called all the robbery locations onto the map.

"No real pattern there," Don observed.

"True. Just 20 dots scattered all over the town. Let's try replaying them in the order they happened." Another command, and Sherlock cleared the dots from the map. The dots came back in time sequence.

"Wow! See the pattern *now*?" asked Katie.

"Yes. The thieves sort of sweep around town like a rotating radar beam," Don observed.

"Right! First, they hit one side of town, then jump to the opposite side, then back," said Katie.

"All that leaping around should keep the police pretty confused," Don admitted.

"Which is precisely the thieves' goal—constant confusion. Let's replot the robberies, but now we'll connect them with lines.

"Oh goodie, connect-the-dots," Don smiled.

Sherlock's screen cleared, and the crimes reappeared—connected by lines like the spokes of a wheel. Many of the lines seemed to intersect at, or near, two points on the map.

"Either of those two points could be important," Katie said. "If they have a central base of operations, chances are the lines would intersect near their hideout."

"Which could be one of those two points," Don said.

"Yes. It isn't guaranteed, but it's possible," Katie added. "Let's check another way. This time, let's connect the places where 'gifts' were stolen, with where they reappeared."

A bit of programming ensued. Katie gave Sherlock instructions about new data to plot on the map.

"Each of these new lines," Katie explained, "is the history of a stolen object. Something disappeared at one end, and reappeared at the other. This line, here, belongs to the crystal cat. Between the ends of each line, the question is: where did the stolen objects go?"

"To the hideout?"

"*Right.* And, look where these new lines meet. The same two points. Almost a bull's-eye," she said.

"I think we should tell the sheriff," said Don.

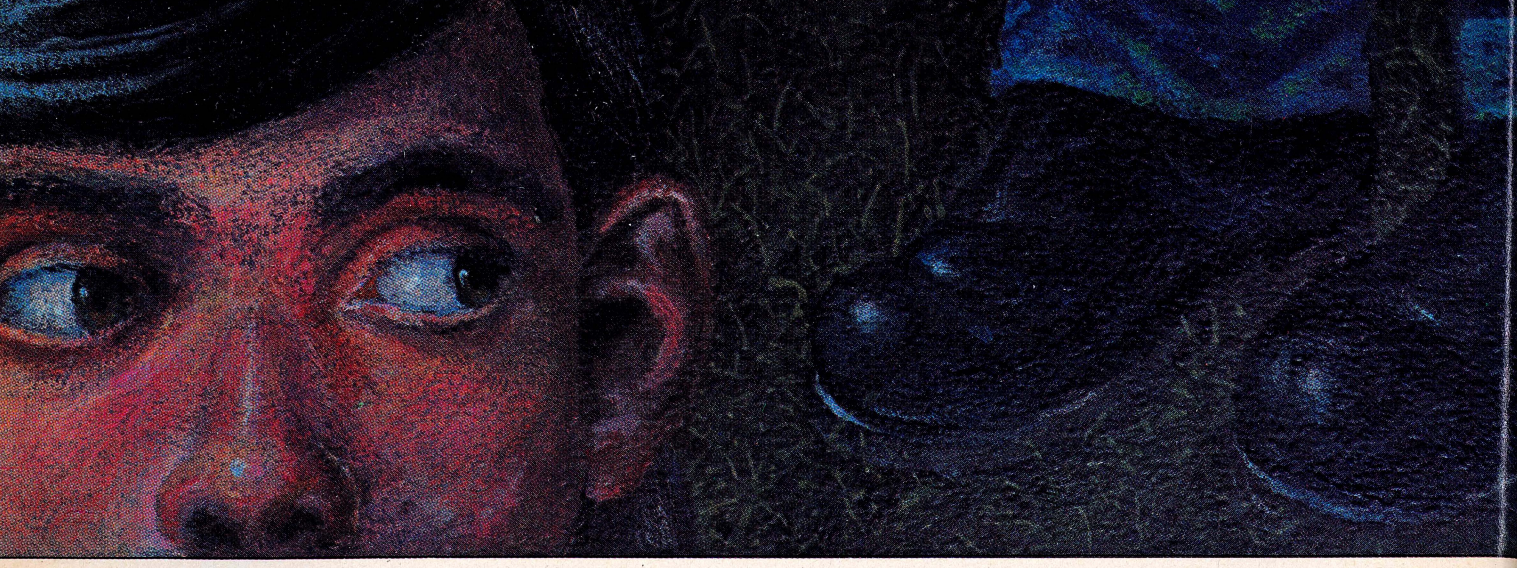
"Not so fast," Katie interrupted. "There's no guarantee he'd believe our story. We have to get proof."

"I volunteer to man the telephone."

"*What*?"

"So we don't miss any anonymous tips."

"That won't be necessary," Katie replied. "I'll need you someplace else tonight."



Bleeeep! Katie's wristwatch alarm went off. She backed away from her hiding place and stepped right on the foot of a very big man.

"I was afraid of that."

"And, I'll even let you choose which of the possible hideouts you want to watch."

Don groaned. He pointed to one site on Sherlock's screen, and agreed to meet Katie later that evening.

Nine P.M. Katie and Don synchronized watches in front of Daniels' Drugs. As a safety precaution, they agreed to return every hour on the hour. Katie set her digital watch alarm for 9:55 to warn her when she had to head back.

They mounted their bicycles, and sped off in opposite directions.

The only real structure near Don's post—a garage—was closed and dark.

Katie found a farm near her post. It looked abandoned, but a light barely showing through the window shades announced that someone was home. A couple of vans stood in tall grass. Katie wrote down the license-plate numbers and hid behind a nearby bush.

Time flew—faster than Katie thought. Her watch startled her with its beeping reminder. She turned the alarm off and backed away from her hiding place. She had barely crawled back when she stepped on the foot of a very big man.

Has Katie backed herself into trouble? Has she bungled into the crooks' hands (or feet)? Should she switch to a quieter wristwatch? Find out in ENTER's next issue, in the exciting conclusion of "The Case of the Crystal Cat."

DAVID B. POWELL is a writer who lives in Massachusetts and specializes in computers. *Story © 1984 David B. Powell*

FROM KATIE'S DOSSIER

Is a story untrue, simply because it's called "fiction?" Not at all! From time to time, we'll peer into Katie Parker's personal file (her "dossier") to see her mystery-solving techniques in action in the real world.

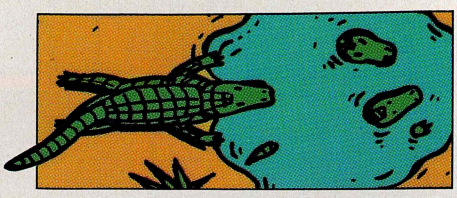
Our first dossier is about "Sherlock's Glass," the TV camera Katie uses to feed pictures directly into her computer. These devices really do exist. At carnivals and computer shows, you'll see them in action—capturing images of people's faces which are then printed on paper—or even on T-shirts.

Until recently, the camera, hardware and software to use "Sherlock's Glass" would have cost thousands of dollars. But that's changed. For example, Micron Technology Inc. makes the MicronEye™ input camera for Apple, IBM PC, Commodore 64 and Radio Shack Color computers. The tiny digital camera comes with its own tripod stand, computer interface and graphic software—all for about $295. Point this camera at anything, and what it sees will go into your computer's memory. (Micron Technology, Inc., Vision Systems Group, 2805 East Columbia Rd., Boise, ID 83706.

—David B. Powell

THE CURIOUS CASE OF THE DISAPPEARING DIAMONDS

Mystery at Flowchart Manor



BY MICHAEL DAYTON

It was a slow day at the Darrell Danger Detective Agency and Fruit Stand. I should know—I'm Darrell Danger.

I was just about to peel another grape when in walks this mad scientist type. I knew he was a scientist because of the white lab coat he was wearing. I knew he was mad because his face was redder than a ripe tomato.

"I've got a big case for you," he said.

"I get a lot of big cases around here," I said, pointing to a crate of watermelons.

"Perhaps you'll find a case of these more interesting," he said, pulling a 36-carat diamond out of his pocket.

My eyes nearly bugged out when I saw it. If he had a hunk of ice that big, I figured I'd better play it cool.

"Recently, I invented a method for making diamonds out of super-cooled ice," my new buddy went on. "I kept the secret formula inside a vault in a locked room in my laboratory. I also spent a fortune to turn the whole building into a maze that would trap any criminal.

"But in spite of all that, someone managed to break in and steal the formula. I want you to catch the thief and get it back."

I could see this wasn't going to be all peaches and cream. "Are there any suspects?" I asked.

"Thanks to my camera system, I know that four crooks broke into my lab late last night," he told me. "They are known as The Thin Man, Big Bald Bubba, Two-Bits Tommy and Snake-Eyes Sandy. Ever heard of them?"

"Sure I know 'em," I said. "They're a rotten bunch of bananas, all right." I reached into my desk and pulled out the files on all four. These crooks were the real pits.

My mad-scientist type pulled out a map of his premises. His security plans had more layers than an onion. He had built in secret passages, a molasses swamp, and an alligator pit. It was as nutty as a fruitcake.

I knew if I didn't remember a few things, I 'd never solve the case. So I pulled out an empty potato sack and wrote them down:

1. A hidden camera at the entrance photographed the thieves as they came in. They had entered one at a time, at one-hour intervals. The Thin Man came in first. An hour later, in came Big Bald Bubba. Next was Two-Bits Tommy, and Snake-Eyes Sandy was last.
2. If a crook made it back to the entrance area, he or she could travel around the house again.
3. Once the vault door was opened, it remained open.
4. Once the guard was put to sleep, he remained asleep.
5. There were only two bags of diamonds in the lab.
6. My client had left a set of keys in his lab coat and it was in the pile of dirty laundry.
7. Each time a piece of ice was placed next to the window, it stayed there without melting till morning.

This case was going to be harder than a coconut to crack. It was peppered with clues. I had to use the floor plan, the files of the four suspects, and the facts I listed on the potato sack. I knew I had to keep track of how many blocks of ice were propped up under the window, and how much each suspect weighed—with and without the bags of jewels.

I started to trace the route of the first crook to enter the lab. Before you could say "Afghanistan Banana stand," I'd gotten to the core of the mystery.

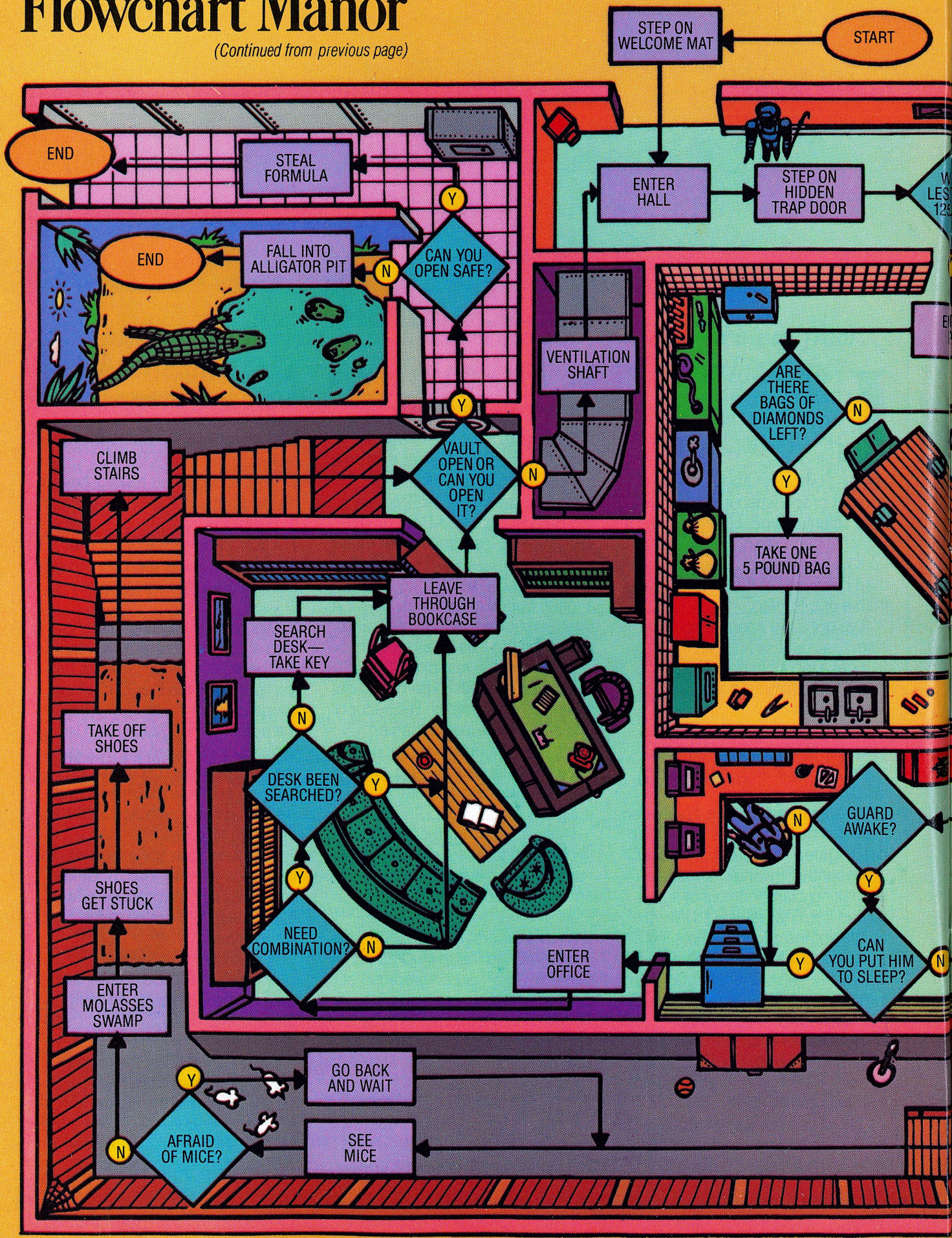
But before I spill the beans, I'll give you a chance to chew it over. Use your noodle and you'll have it solved in no time.

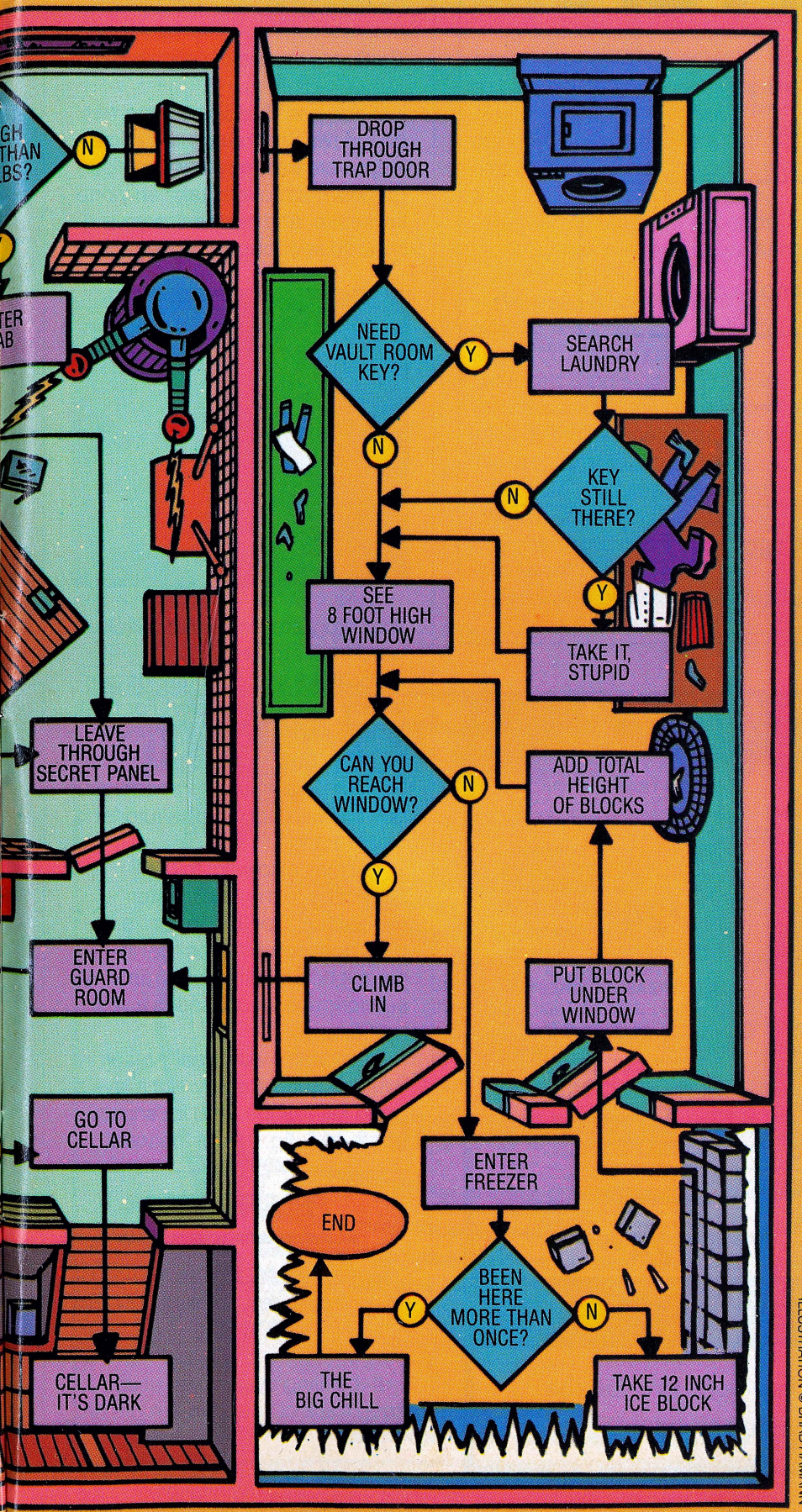
TURN THE PAGE for the map of Flowchart Manor. Turn to page 51 for the answer to the mystery.

MICHAEL DAYTON, *freelance writer, wrote ENTER's "Win a Robot!" contest.*

Flowchart Manor

(Continued from previous page)





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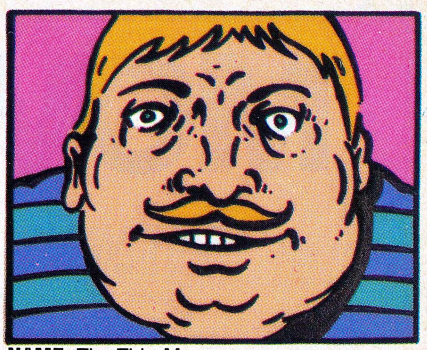
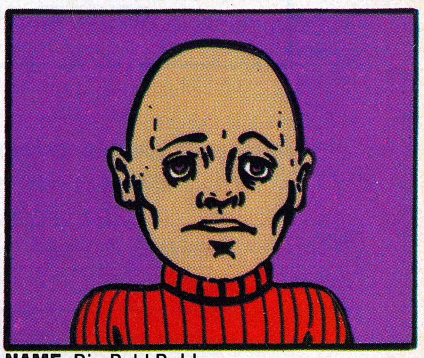
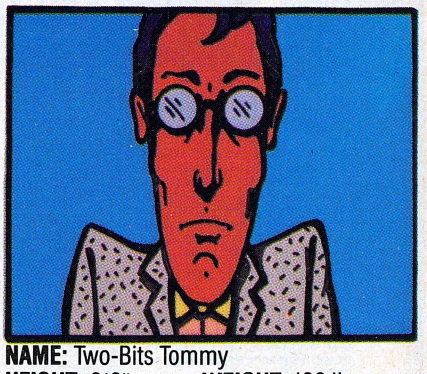


NAME: The Thin Man
HEIGHT: 7'1" **WEIGHT:** 347 lbs.
Expert locksmith. *Can* open doors; *can't* open safe. Afraid of mice.



NAME: Big Bald Bubba
HEIGHT: 4'1" **WEIGHT:** 124 lbs.
HEIGHT WITH ELEVATOR SHOES: 6'2"
Safecracker. Wears elevator shoes.



NAME: Two-Bits Tommy
HEIGHT: 6'2" **WEIGHT:** 126 lbs.
Expert lockpick; can open any door, but not safes.

NAME: Snake-Eyes Sandy
HEIGHT: 5'11" **WEIGHT:** 122 lbs.
Expert hypnotist; she could put guard to sleep. Afraid of mice.

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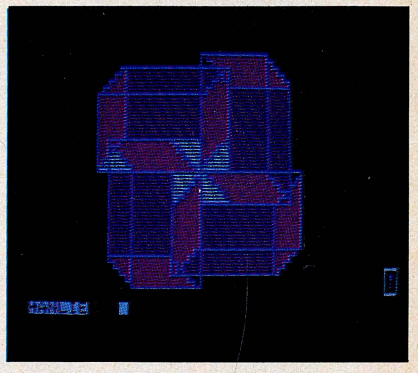
SOFTWARE SCANNER

(Continued from page 21)

just designs. Special "teleporters" (to run two programs at one time) let you create fancy arcade-type games. Instructions take only one keystroke, and happen as you type. To spot bugs, you can run



your programs forward *or* backward from any step.

You'll like this: your friends can legally copy *Spellcaster*! For best results, each user should buy a manual (*The Book of Spells*; $12.95). The manual is academic, but you will find the disk tutorial is outstanding.

You may also want to subscribe to the Spellcaster newsletter, "Spellswapper," a disk/print combination that includes helpful utility programs. A subscription for six issues a year is $55.

Spellcaster won't really *teach* you computer literacy, but it lays a good foundation. And for snazzy game-making, it's got the touch.

PHI BETA FILER

(Scarborough, $49.95; disk, available for all Apple computers, Commodore 64, IBM PC & PCjr)

If the filing system you use to keep track of your paper route or

stamp collection is a mess, *Phi Beta Filer* (PBF) could be just the organizing tool that you need at home.

PBF is an easy-to-use system that lets you "file" information into pre-programmed categories like Address Book and Coin Collection.

You then can update the items whenever necessary. Some of the other files on the disk—Income Taxes and Inventory, for example—may not interest you, but your parents might find them useful.

(You can also make up your own categories.)

PBF has a nice feature that allows you to find certain files without having to flip through an entire category.

Let's say that you want a list of all the people along your paper route who tip more than 50¢ a week. You tell the computer, what you want and it scans the category. Within a few seconds, those names will begin appearing on the screen.

You need as much self-discipline to keep *PBF* files up-to-date as you do with any non-computerized filing system. So unless you have a lot of things to keep track of, think twice about getting this program.

But *PBF* is so very easy and efficient (and really kind of fun), it will help make organizing a little easier to handle.

—(Reviewed by *Jessica Wolfe*)

FLOWCHART *(page 47)*

Here's what happened on the night of the crime.

The Thin Man got trapped by the mice in the cellar of The Manor. **Big Bald Bubba** picked up one bag of diamonds then lost his shoes in the molasses swamp. The second time he went through the hall, Bubba fell through to the laundry and ended up in the freezer. **Two-Bit Tommy** got as far as the safe, but fell into the alligator pit.

That left **Snake-Eyes Sandy** as the thief. She put the guard to sleep, got the combination in the office, and then was able to steal the formula.

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CONTEST WINNERS!

STRANGE FACES...

ANSWERS TO CONTEST # 1

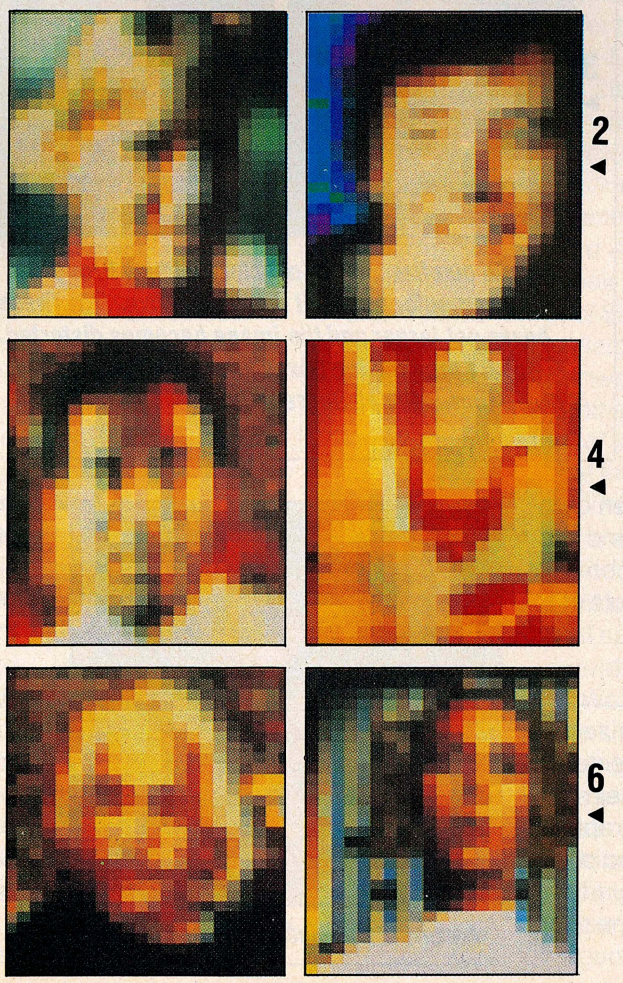
Remember these faces? They were the stars of ENTER's "Face-Off" contest in our April, 1984, issue. For those of you who are tuning in a little late, the challenge was to identify six celebrities whose faces had been pixelized beyond recognition by computer. Then to make things even tougher, ENTER asked for a description of how each celebrity was tied in to the world of computers, electronics or space technology.

Aaron Loudon, 12, from London, Ohio, was the winner! He identified all the faces correctly and won the grand prize—an Atari 800XL and a library of Activision games.

Aaron wasn't the only person to get the right answers—15 others did, too. So to pick a grand prize winner, we held a tie-breaker. The challenge was to guess the number of pixels that made up the photo of Matthew Broderick. Most people guessed around 600; that's how many boxes the photo had been broken into. The correct number of pixels was 16,500.

Who *were* the stars behind the pixelization? Aaron Loudon saw through the disguises, but some of you mistook celebrity number one for Sting, lead singer with the Police, and others guessed it was John Glenn. Not even close.

Celebrity #1 is Martina Navratilova, who uses a computer to improve her tennis game and to regulate her diet ("Martina's High-Tech Trainer," ENTER, October, 1984).



PHOTOS PIXELIZED BY NATIONAL IMAGEMAKERS, INC.

Celebrity #2 is Matthew Broderick, no relation to Matthew Laborteaux or Han Solo, or any of the other names some of you guessed. Matthew Broderick played David Lightman, a computer hacker in the movie *WarGames*.

Hey! Hey! Hey! *Celebrity #3 is Bill Cosby.* You may remember that he used to do commercials for Texas Instruments home computers.

Celebrity #4 is Dirk the Daring, hero of the *Dragon's Lair* arcade game. Some of you mistook Dirk for his distant cousin Flash Gordon. Sorry, wrong hero.

Celebrity #5 is Albert Einstein, the world-renowned physicist—a genius with a mathematical mind that was almost like a computer.

Celebrity #6 is actress Carrie Fisher, costumed

STRANGE FACES...

(Continued from previous page)

for her role as Princess Leia in *Star Wars*. How could anybody think that she was inventor Ray Kurzweil? It's hard to believe, but someone did.

PLUGGING INTO PIXELS

How did these celebrities get pixelized? And what *is* pixelization, anyway?

"Pixelization is used to give images a computerized look," says Martha Camsler, the artist who worked with ENTER on these photographs.

When a photograph is pixelized, every one of the many thousands of picture elements—or pixels—that make up an image on a computer screen combines with other pixels around it to form a box. The result is a photograph that's broken into lots of little boxes.

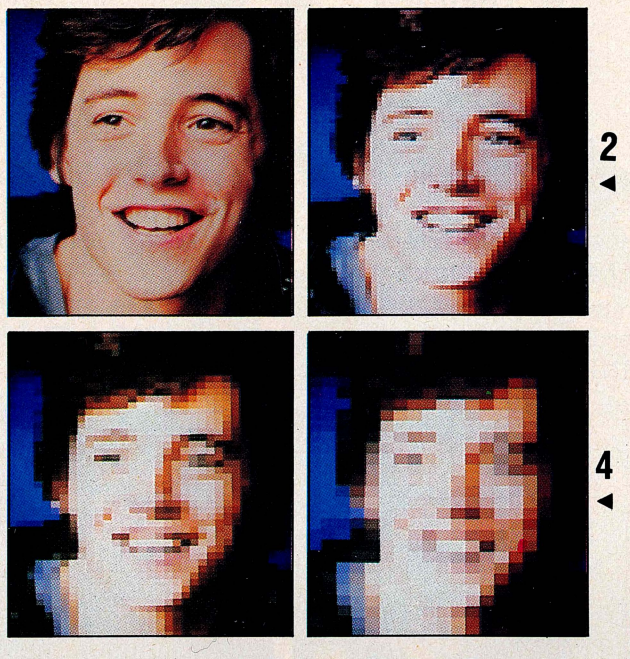
HOW IT'S DONE

Martha used a computerized pen and touch tablet connected to a special DEC PDP 1123 mainframe computer that has graphics software built in. She started off by placing each photograph under a video scanner. This machine scans the picture and sends it through an encoder that will break down what it "sees" into lots of ones and zeros. Next, it relays this information directly into the computer's memory. Now Martha is ready to work her magic.

Martha started off her pixelizing work by bringing each photograph up on her computer screen. Then she told the computer to break down the picture into areas of, say, two by three pixels. These areas form boxes. That's why a pixelized photograph looks like it's broken into boxes. The computer combines the colors within each box, and comes up with one color that is the "average" of all of them. Martha can increase the size of the boxes—the larger the boxes, the more unrecognizable the photograph.

Martha then began touching up and enhancing these images. Using a palette of more than 19 million colors and choosing from over 100 different brushes, Martha enhanced the color in each picture. She blended in rough spots, and gave the images a finished look.

The results? Well, they stumped a lot of you! —*Elizabeth Hettich.*



(1) To pixelize a photo of actor Matthew Broderick (2) a computer breaks it down into boxes. (3) These boxes get larger and the image becomes distorted. (4) By the time the boxes have been enlarged 15 times, the photograph is unrecognizable.

Aaron, 12, guessed the Face-Off faces.

PHOTOS PIXELIZED BY NATIONAL IMAGEMAKERS, INC.

CONTEST WINNERS!

...AND LOST ROBOTS

ANSWERS TO CONTEST # 2

LOST: One robot, black and white, approximately 12 inches high. Answers to the name F.R.E.D. Distinguishing features: two small red lights that blink occasionally. If found, please return to ENTER Magazine.

Much as he might have liked to, F.R.E.D. didn't stay hidden for long. Within a few weeks after our "Lost Robot" contest ran in the June issue of ENTER, almost 2,000 dedicated F.R.E.D.-finders sent in their guesses to the 11 questions and dug up other hints buried in the contest.

Just about everyone who tried to find F.R.E.D. did a very impressive detective job. Not everyone found the robot, however. Many of you went on a wild robot chase to places like the Hollywood Bowl, the EPCOT Center parking lot, Mount Sneffels Crater and even Grauman's Chinese Theatre!

By the time you read this, F.R.E.D. will have settled nicely into his new home with Jove Graham,10, from Ottsville, Pennsylvania. In addition to giving us the 11 right answers, Jove found the 11 hints we had buried, plus 19 others *we* didn't even know were in there.

The answers were: Czechoslovakia (we also accepted Bohemia); Suez Canal, Egypt; Japan; Tokyo; Mariana Trench (or Challenger Deep); Christmas Island; Nautilus; Cape Canaveral, Florida; the Earth's moon—and F.R.E.D.'s hiding place—the Jules Verne Crater on the dark side of Earth's moon.

Many of the hints we had hidden were titles of Jules Verne books (*20,000 Thousand Leagues Under the Sea, Journey to the Center of the Earth, Mysterious Island*). The names of Verne characters like Phileas Fogg (from *Around the World in 80 Days*) and Pencroft (*Mysterious Island*) were also conveniently dropped into the contest.

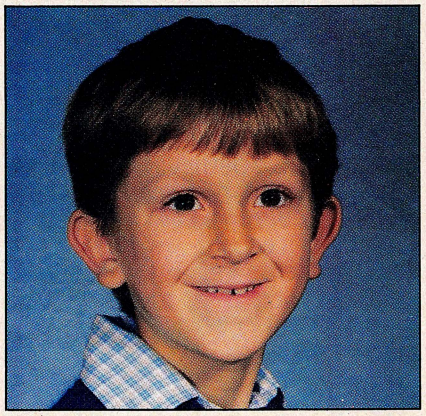
Other clues were a little harder. For example, this statement in clue H: "Egads! a bad *omen, captain*... your boat has drifted away *backwards*." If you look closely at this clue, you'll see that "omen" backwards reads "Nemo," the name of the captain villain in Verne's *20,000 Leagues Under the Sea.* Also, if you look over the *first* letter of clues B through K, you'll see that they spell out J-U-L-E-S -V-E-R-N-E...backwards! These, and the other clever touches, were dreamed up by ENTER freelance writer Michael Dayton.

We'd like to thank everyone for their great work trying to solve this contest. "Honorable Mentions" go to some of the more unusual entries we received: *Kevin Walsh,* Williamstown, NJ, and *Amy and Stephen Loch* of Springville, PA, for their very imaginative entries; *Amy and Melissa Turner* of San Jose, CA, *Laura Geesey,* Columbia, SC, and *Aaron Spencer,* Canaseraga, NY, for their maps and artwork; and *Jeff Shapiro,* Springfield, MO, and *Bill Mathey,* Southbury, CT, for the supporting "evidence" and detailed descriptions that they sent in with their answers.

The 30 top runners-up will receive ENTER T-shirts, and posters from Androbot, Inc., the California personal robot company that sponsored the contest and provided F.R.E.D.

We don't have room to list all of the hints that winner Jove Graham found, but we will send them to those die-hard F.R.E.D. finders who really need to know. Mail a self-addressed, 20-cent stamped envelope to: F.R.E.D., ENTER, 1 Lincoln Plaza, New York, NY 10023.

—Jessica Wolfe.



Jove, 10, found F.R.E.D. on the moon.

BASIC TRAINING

PROGRAMS FOR YOUR COMPUTER

Apple, Adam, Atari, Commodore 64, IBM, TI 99/4A, Timex-Sinclair, TRS-80 Color Computer, VIC-20

OUT OF THE RANGE (To the tune of the chorus from "HOME, HOME ON THE RANGE")

My variable's out of range,
And the stuff on my screen looks real strange.
My syntax is wrong,
And my program's too long,
And my newest game cartridge won't play.

Howdy, all you BASIC Buckaroos! Yessiree, I reckon it's dad near time for 'nother eight pages of BASIC Training. This time, pardner, we've rounded up a whole passel of programs that are more fun than a barrel of jackrabbits on loco weed. And that ain't all, by a long shot. We lassoed us a new one of them there "BASIC Plus" columns. This one's 'bout that dang fangled language called Assembly.

It's a might easier than smoke signals, that's fer sure.

Ye say ye want more? How 'bout one of them BASIC Glossaries and a new programmin' Challenge? If that don't keep you varmints satisfied for a while, I'll be hogtied in a holler full of short-tempered sidewinders.

So get to it, all you program-punchers. Meanwhile, I'm gonna saddle up ole PAINT and ride off into the sunset.

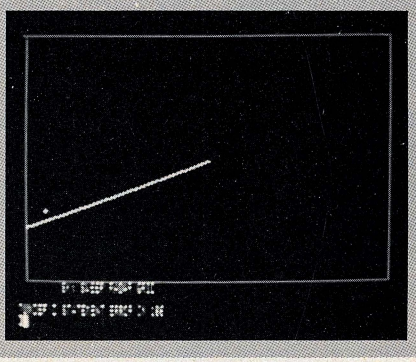
—Richard Chevat, Technical Editor.

RANDOM RADAR: APPLE

Want to practice your skills as an air traffic controller? Search the skies for incoming alien spacecraft? This program won't really turn your Apple into a radar screen, but it will look like one.

Lines 10 through 140 set up the screen and the variables you need for the sweeping "radar" line. Line 150 is the start of the loop that makes the line move. Lines 290 through 360 draw and erase a "blip".

By the way, if you'd rather be the captain of a submarine, just change the PRINT statement on line 50 to "SONAR GRID."



```
10   PRINT : PRINT
20   BX = 5
30   BY = 1 + INT (156 * RND (1))
40   HTAB (10)
50   PRINT "SKY SWEEP RADAR
     GRID"
60   DT = .1
70   C = COS (DT):S = SIN (DT)
80   SC = 1.16
90   CX = 140:CY = 80
100  HGR : GOSUB 430
110  XT = 0:YT = - 0
120  X = 0:Y = 80
130  HCOLOR= 3
140  HPLOT 3,18
145  REM LOOP TO SWEEP
150  FOR I = 1 TO 63
160  T = X * C - Y * S
170  Y = Y * C + X * S
180  X = T
190  H1 = 1.7 * SC * X + CX
200  V1 = Y * 1.5 + CY
210  IF H1 < 4 THEN H1 = 4
220  IF H1 > 278 THEN H1 = 278
230  IF V1 < 1 THEN V1 = 1
240  IF V1 > 158 THEN V1 = 158
250  HCOLOR= 0
260  HPLOT (BX - 1),BY
270  HPLOT BX,(BY - 1) TO
     BX,(BY + 1)
280  HPLOT CX,CY TO XT,YT
285  REM DRAW BLIP
290  HCOLOR= 3
300  HPLOT CX,CY TO H1,V1
310  HPLOT BX,BY TO (BX + 2),BY
320  HPLOT (BX + 1),(BY - 1) TO
     (BX + 1),(BY + 1)
330  IF BX < 277 THEN GOTO 390
340  HCOLOR= 0
350  HPLOT BX,BY
360  HPLOT (BX + 1),(BY - 1) TO
     (BX + 1),(BY + 1)
370  BY = INT (156 * RND (1)) + 1
380  BX = 5
390  BX = BX + 1
400  XT = H1:YT = V1
410  NEXT I
420  GOTO 150
430  HCOLOR= 1
440  HPLOT 0,0 TO 279,0
450  HPLOT TO 279,159
460  HPLOT TO 3,159
470  HPLOT TO 2,0
480  RETURN
```

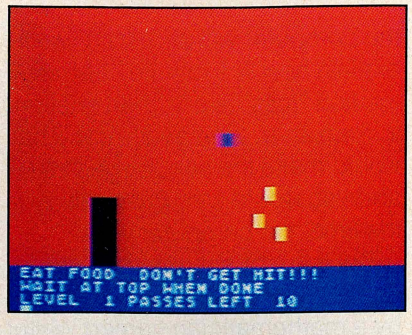
—Daniel E. Cohn

BAR BATTLE: ATARI

In "Bar Battle," your mission is to eat dots (sound familiar?). But *these* dots are guarded by a black bar that sweeps across the screen. You must use your joystick to maneuver around the bar and eat the dots without touching the bar. You have 10 passes of the bar to get them all. When you're done, wait at the top of the screen for the bar to pass by, and you'll be given a new screen.

As you get to higher levels, the bar gets taller. Finally, there is just enough room for you to squeeze over as it goes by. And watch out for level 10—the bar starts moving twice as fast!

```
5     REM BAR BATTLE
10    GR. 3:SE. 4,5,5:LEV=1
20    HPO=53248:PCO=704
30    NOHIT=53278
40    A=PEEK(106)-8
50    POKE 54279,A
60    MYPM=256*A
70    POKE 559,46:POKE 53277,3
80    POKE HPO,0:GOSUB 7000
195   REM GAME LOOP
200   LOSE=0:TRY=0
210   X=20:Y=0:GOSUB 5000
220   POKE NOHIT,0:GOSUB 1000
230   ? CHR$(125);"EAT FOOD.
      DON'T GET HIT!!!"
240   ? "WAIT AT TOP WHEN
      DONE"
250   ? "LEVEL ";LEV;" PASSES
      LEFT ";10-TRY
260   LEFT=0:STP=1
270   IF LEV>10 THEN STP=2
280   FOR HP=40 TO 208 STEP STP
290   GOSUB 2000:POKE HPO, HP
300   GOSUB 4000
310   IF LOSE=1 THEN GOTO 200
320   NEXT HP
330   IF LEFT=0 THEN ?
      CHR$(125);"YOU WIN":
      LEV=LEV+1:GOTO 200
340   TRY=TRY+1
350   IF TRY>10 THEN GOSUB
      8000
360   IF LOSE=1 THEN GOTO 200
370   GOTO 230
```




```
1000  REM SET UP BAR
1010  ROOM=80-(LEV*5)
1020  IF ROOM<20 THEN
      ROOM=20
1030  FOR I=MYPM+512+
      ROOM TO MYPM+
      640-33
1040  POKE I,255: NEXT I
1050  RETURN
2000  REM CURSOR
2010  COLOR 0:PLOT X0,Y0
2020  COLOR 3:PLOT X,Y
2030  X0=X:Y0=Y
2040  A=STICK(0)
2050  IF A=15 THEN RETURN
2060  IF A=7 THEN X=X+1
2070  IF A=11 THEN X=X-1
2080  IF A=13 THEN Y=Y+1
2090  IF A=14 THEN Y=Y-1
3000  IF X>39 THEN X=39
3010  IF X<0 THEN X=0
3020  IF Y<0 THEN Y=0
3040  IF Y>19 THEN Y=19
3050  RETURN
4000  REM COLLISION?
4010  HIT=PEEK(53252)
4020  IF HIT=0 THEN RETURN
4030  IF HIT=1 THEN GOSUB
      6000:RETURN
4040  GOSUB 8000: RETURN
5000  REM MAKE TARGETS
5010  NUMTARG=LEV*
      3:COLOR 1
5020  FOR I=1 TO NUMTARG
5030  YY=INT(RND(-1)*12 +
      (15-LEV))
5040  IF YY>19 THEN 5030
5050  PLOT INT(RND(-1)*
      30+5),YY
5060  NEXT I:RETURN
6000  REM HIT DOTS
6010  SOUND 0,20,10,5
6020  FOR S=1 TO 5: NEXT S
6030  SOUND 0,0,0,0
6040  POKE NOHIT,0
6050  LEFT=1:RETURN
7000  REM CLEAR SPRITE
7010  FOR I=MYPM+512 TO
      MYPM+640
7020  POKE I,0:NEXT I
7030  RETURN
8000  REM YOU LOSE
8010  ? CHR$(125);"YOU LOSE"
8020  FOR I=1 TO 255 STEP 5
8030  SOUND 0,I,10,5:NEXT I
8040  POKE NOHIT,0
8050  POKE HPO,0:LOSE=1
8060  SOUND 0,0,0,0
8070  LEV=LEV-1:IF LEV<1
      THEN LEV=1
8080  GOSUB 7000
8090  GR. 3:POKE 559,46
9000  SE. 4,5,5: RETURN
```

—*Jim Clark*

SOUND????: TIMEX-SINCLAIR 1000, 1500

The Timex-Sinclair 1000 and 1500 don't have sound built in. But Steve Urbuaer, age 13, of Lincoln, Nebraska, has figured out a way to make music with them, anyway. You just have to use a radio as a peripheral.

Put an AM radio next to your computer and tune it to an "open" channel (one with no station on it). Then run the program and listen.

```
10    FOR A=1 TO 5
20    FOR B=1 TO 25
30    GOSUB 190
40    NEXT B
50    FOR C=1 TO 50
60    GOSUB 190
70    NEXT C
80    FOR D=1 TO 75
90    GOSUB 190
100   NEXT D
110   FOR E=1 TO 50
120   GOSUB 190
130   NEXT E
140   FOR F=1 TO 100
150   GOSUB 190
160   NEXT F
170   NEXT A
180   GOTO 10
190   SLOW
200   FAST
210   RETURN
```

—*Steven Urbauer*

(BASIC Training continues on next page)

(BASIC Training cont. from previous page)

TAILS I WIN, HEADS YOU LOSE:

APPLE, ADAM, ATARI, COMMODORE 64, IBM, TIMEX-SINCLAIR, TI 99/4A, TRS-80 COLOR COMPUTER, VIC-20

When you play this betting game with your computer, you'll see how this progam got its name. No matter which combination of heads and tails you bet on, the computer can pick a combination that gives it a better chance of winning.

The program asks you to pick a sequence of three coin tosses (line 100). It can be any combination of three heads (H) or tails (T). The computer will pick a different sequence, which it bets on.

Then the program simulates a coin toss with the RND function in line 190. (*What's an* RND *function? See this month's BASIC Glossary.*) Each "toss" is either a T for tails or H for heads. The computer keeps tossing coins until one sequence of three shows up. If your pick comes up first, you win.

For example, if you pick THH, the computer will pick HTH (we'll explain how in a minute). Let's say the first "toss" is a T, then another T, then an H, then another H. That would make the sequence TTHH and you would win. But most of the time, the computer wins.

Believe it or not, the principle behind this game was discovered by a mathematician named Walter Penney. How does it work? In line 120 the computer drops the last letter of your choice. Then in lines 130 and 140, it adds the opposite of the middle letter of your choice to the front of the two remaining letters.

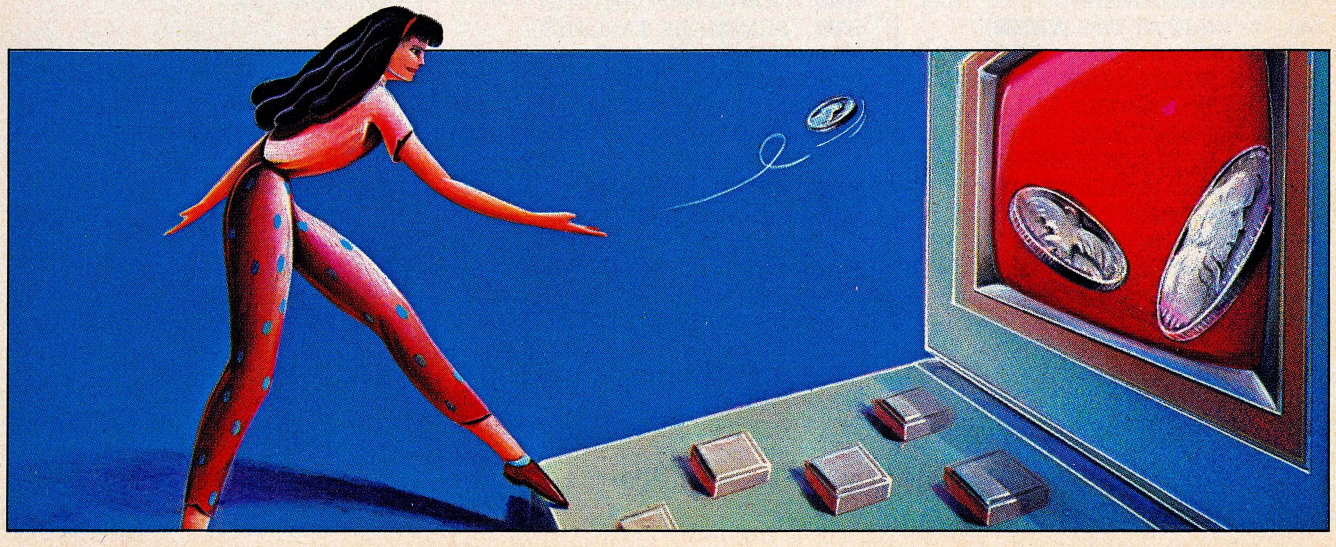
For example, say you choose HHT. The computer drops the last T, leaving HH. Then it adds a T (the opposite of your middle letter) to the front, making THH. You can still win, but the computer has the edge. Try it on your friends—dare them to beat the computer.

The program below is for Apple and Adam computers. Following it are instructions for adapting it for other computers.

APPLE, ADAM:

```
10   TEXT : HOME
20   PRINT "HOW MUCH MONEY
     WOULD YOU LIKE TO START
     WITH ?";
30   INPUT M
40   HOME
50   PRINT "YOU NOW HAVE
     ";M;" DOLLARS"
60   PRINT "HOW MUCH DO YOU
     WISH TO BET ON THIS
     TURN ?"
70   INPUT B
80   IF B > M THEN 40
90   T$ = ""
100  PRINT : PRINT "WHAT
     COMBINATION OF HEADS
     AND TAILS DO YOU BET
     ON?"
110  INPUT H$
115  REM COMPUTER'S BET
120  C$ = LEFT$ (H$ ,2)
130  IF MID$ (H$ ,2,1) = "T"
     THEN C$ = "H" + C$ :
     GOTO 150
140  LET C$ = "T" + C$
150  HOME
160  PRINT "I BET ON ";C$
170  PRINT "PRESS RETURN FOR
     THE NEXT TOSS"
180  INPUT X$ : PRINT : PRINT
185  REM COIN TOSS
190  LET R = INT ( RND (1) * 2 +
     1)
200  IF R = 1 THEN 240
210  LET T$ = T$ + "T"
220  PRINT "TAILS!"
230  GOTO 260
240  LET T$ = T$ + "H"
250  PRINT "HEADS!"
260  PRINT : PRINT "WE HAVE ";
     T$; " SO FAR"
```

(Program continues on next page)



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(Program continued from previous page)

```
270  PRINT : PRINT
280  IF RIGHT$ (T$ ,3) = H$ THEN
     350
290  IF RIGHT$ (T$ ,3) < > C$
     THEN 170
300  PRINT "I WIN!"
310  LET M = M - B
320  FOR G = 1 TO 1000: NEXT G
325  REM OUT OF MONEY?
330  IF M < = 0 THEN 400
340  GOTO 40
350  PRINT "YOU WIN!"
360  FOR G = 1 TO 1000: NEXT G
370  LET M = M + B
380  GOTO 40
390  PRINT
400  PRINT "SORRY, YOU'RE OUT
     OF MONEY"
410  PRINT "WOULD YOU LIKE TO
     PLAY AGAIN? Y/N"
420  INPUT X$
430  IF X$ = "Y" THEN 10
```

COMMODORE 64 AND VIC 20: Change lines **10**, **40** and **150** to:

```
PRINT CHR$ (147)
```

Change line **190** to:

```
190  R=INT (RND (1)*2)+1
```

IBM PC AND PCJR: Change lines **10**, **40**, and **150** to: **CLS**

Add or change these lines:

```
5    RANDOMIZE TIMER
190  R=INT (RND*2)+1
```

TRS-80 COLOR COMPUTER: Change lines **10**, **40** and **150** to: **CLS**

Change line **190** to:

```
190  R=RND(2)
```

TI 99/4A: Change lines **10**, **40** and **150** to: **CALL CLEAR**

Add or replace these lines:

```
5    RANDOMIZE
45   I=0
120  C$=SEG$(H$,1,2)
130  IF SEG$(H$,2,1)<> "T"
     THEN 140
131  C$="H" + C$
132  GOTO 150
140  C$="T" + C$
175  I=I+1
190  R=INT(2*RND)+1
260  PRINT
261  PRINT "WE HAVE ";T$;" SO
     FAR"
280  IF SEG$(T$,I,3)=H$ THEN
     350
290  IF SEG$(T$,I,3)<> C$ THEN
     170
320  FOR G=1 TO 500
321  NEXT G
360  FOR G=1 TO 500
361  NEXT G
```

ATARI: Change lines **10**, **40** and **150** to:

```
PRINT CHR$(125)
```

Add or change these lines:

```
5    DIM T$(30),X$(1),H$(3),C$(5)
41   I=0
120  C$(2,3)=H$(1,2)
130  IF H$(2,2)="T" THEN
     C$(1,1)="H":GOTO 150
140  C$(1,1)="T"
185  I=I+1
190  R=INT(RND(0)*2)+1
210  T$(I)="T"
240  T$(I)="H"
275  A=LEN(T$):IF A<3 THEN
     170
280  IF T$(A-2,A)=H$ THEN
     350
290  IF T$(A-2,A)<>C$ THEN
     170
```

TIMEX SINCLAIR 1000,1500,2068: Change lines **10**, **40** and **150** to: **CLS**

Break up all multiple statement lines. All **IF THEN** statements must include a **GOTO**.

Add or replace these lines:

```
5    RAND 0
7    DIM C$(10)
15   LET I=0
45   LET I=I+1
120  LET C$(2 TO 3)=H$(1 TO 2)
130  IF H$(2)="T" THEN GOTO
     145
140  LET C$(1)="T"
142  GOTO 150
145  LET C$(1)="H"
190  LET R=INT(RND*2)+1
280  LET A$=T$(I TO I+2)
285  IF A$=H$ THEN GOTO 350
290  IF A$<> C$ THEN GOTO
     170
430  IF X$="Y" THEN GOTO 10
```

—David Lewis

(BASIC Training continues on next page)

BASIC GLOSSARY
RND FUNCTIONS

All microcomputers have a way of creating so-called random numbers. Usually, they do this with a function called RND. By using the RND function on your computer, you can add an element of chance to your programs, games or graphics. For example, in this month's program "Heads I Win, Tails You Lose," the RND function is used to simulate the flipping of a coin.

The RND function is slightly different on almost every computer. Usually, it gives you a number between zero and one. These numbers are decimal fractions, like .1394678. That's why you usually see the RND function as part of an equation. The equation is used to translate the decimal fraction into a form that the program can use.

The numbers you get with a RND function are not truly random. They are actually a series of numbers that are the same every time you start up your computer. Most computers have a way of starting the sequence in a different place every time. For example, the IBM PC and the TI 99/4A use the RANDOMIZE command to do this. By using RANDOMIZE on these computers, you can get different results with the same program.

BASIC TRAINING

(BASIC Training cont. from previous page)

CHALLENGE #10: SCIENTERRIFIC

All scientists use computers. Everything from space shuttles to gene splicing depends on silicon chips and microprocessors. But what about the rest of us?

This month we want you to write a program that helps you learn about science. It can be about astronomy, biology, chemistry or some other field. Maybe you'll want to write an astronomy program with graphic displays of the solar system. Or a weather prediction program. Or a program that tests your knowledge of the animal kingdom.

Send your program to CHALLENGE #10, ENTER Magazine, CTW, 1 Lincoln Plaza, N.Y., N.Y. 10023. We'll pick the best program and print them in BASIC Training. The winners will receive $50 and an ENTER T-shirt.

Programs can be for any home computer, but you must keep them under 75 lines. Remember to enclose a note telling us your name, age, T-shirt size, the computer the program was written for, and a brief description of the program.

Entries must be postmarked no later than December 15, 1984. We read every program that is sent in, but we cannot reply to each of you.

And remember, if you've written any other programs you think belong in ENTER, send them to BASIC Training at the address above. We pay between $25 and $50 for programs we publish.

WINNER OF CHALLENGE #7: CHRISTMAS ALARM

TRS-80 COLOR COMPUTER

For challenge #7, we asked you to write a program for the holiday season. Jeff Wozniak, 12, of Apple Valley, Minnesota, and Jose Santos, 16, of Seaford, Delaware, both sent in Christmas programs. They were both good, and we thought they would be even better if they were put together. The result is a Christmas alarm clock that wakes you up and shows you a holiday greeting. Right now, the alarm is set for 7:30, but you can change that by changing line 80.

```
10   CLS
20   INPUT "HOUR ";A
30   INPUT "MINUTE ";B
40   INPUT "SECOND   ";C
50   CLS
60   PRINT @ 202,A":"B":"C
70   FOR Z=1 TO 550:NEXT Z
80   IF A=7 AND B=30 AND C=1
     THEN 130
90   IF C=60 THEN B=B+1:IF
     C=60 THEN C=0
100  IF B=60 THEN A=A+1:IF
     B=60 THEN B=1
110  IF A=12 THEN A=1
120  C=C+1:GOTO 60
130  FOR A=1 TO 13
140  PLAY"T13;V31;01;
     C;D;E;F;G;F;E;D;C"
150  NEXT A
160  FOR A=1 TO 460*2:NEXT A
170  PMODE 3,1:PCLS
180  SCREEN 1,0
190  CIRCLE (164,108),8,3
200  PAINT(166,110),3,3
210  CIRCLE(84,100),8,3
220  PAINT(84,100),3,3
230  LINE(120,36) -
     (136,56),PSET,B
240  LINE(120,56)-(84,70),PSET
250  LINE-(76,20),PSET
260  LINE-(120,36),PSET
270  LINE(136,56)-(172,70),PSET
280  LINE-(178,20),PSET
290  LINE-(136,36),PSET
300  PAINT (128,40),2,4
310  PAINT(100,40),4,4
320  PAINT(156,40),4,4
330  COLOR 2,1
340  LINE(82,56)-(64,72),PSET
350  LINE-(48,78),PSET
360  LINE(116,60)-(120,72),PSET
370  LINE-(104,100),PSET
380  LINE-(104,110),PSET
390  LINE-(48,78),PSET
400  LINE(116,60)-(84,70),PSET
410  LINE-(82,56),PSET
420  PAINT(88,72),2,2
430  LINE(140,58)-(134,72),PSET
440  LINE-(152,104),PSET
450  LINE-(150,114),PSET
460  LINE-(210,74),PSET
470  LINE-(194,74),PSET
480  LINE-(174,56),PSET
490  LINE-(172,70),PSET:LINE -
     (140,57),PSET
500  PAINT (156,70),2,2
510  DRAW"C4;BM 76,144;
     H4L8G4F4R8F4G4L8H4"
520  DRAW"BM 96,144;
     H4L8G4D4R12L12D4F4R8E4"
530  DRAW"BM 116,156;
     U12H4L8G4D4R16L16D8"
540  DRAW"BM 136,144;
     H4L8G4F4R8F4G4L8H4"
550  DRAW"BM 156,144;
     H4L8G4D8F4R8E4U8"
560  DRAW"BM 176, 140;F4D8G4"
570  LINE(174,156) -
     (164,140),PSET
580  DRAW"BM 164,140;G4D8F4"
590  DRAW"BM 202,144;
     H4L8G4F4R8F4G4L8H4"
```

(Program continues on next page)

(Continued from previous page)

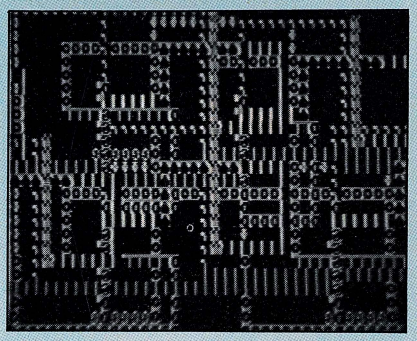
```
600  DRAW"BM 182,138;
     D4U4L2D2R2"
610  DRAW"BM 56,164;
     H4L8G4D8F4R8E4U4L8"
620  DRAW"BM 96,164;
     H4L8G4D4R8L8D4F4R8E4"
630  DRAW"BM 76,176;
     H8L8R12E4H4L8G4D8F4"
640  DRAW"BM 116,164;
     H4L8G4D4R8L8D4F4R8E4"
650  DRAW"BM 136,164;
     H4L4D16U16L4G4"
660  DRAW"BM 156,164;
     H4L8G4E4R4D16L4H4F4R8E4"
670  DRAW"BM 174,160;F4D8G4"
680  LINE(174,174) -
     (164,160),PSET
690  DRAW"BM 164,160;G4D8F4"
700  DRAW"BM 198,164;
     H4L8G4D8F4R8E4U4L8"
710  DRAW"BM 218,164;
     H4L8G4F4R8F4G4L8H4"
720  GOTO 720
```

—Jeff Wozniak and Jose Santos

BLACKBOARD: COMMODORE 64

Last month we printed a program called VIC Blackboard, which let you use the Commodore character set to draw designs on your screen. Here's the same program adapted for the C-64.

You use the I, J, K, and M keys to move the characters around the screen, and the space bar to change the character you are drawing with. Press Q to start over. Note: CTRL-2 means hold down the CTRL key and press 2.



```
10   PRINT CHR$ (147); "CTRL-2"
20   A=1272:B=1721
30   C=1295:D=1775
40   GOSUB 700:P=0
50   GET M$ :IF M$ = "" THEN 50
60   IF M$ = "" THEN P=0
70   IF M$ = "" THEN POKE
     A,T:POKE B,T:POKE
     C,T:POKE D,T:GOTO 50
80   IF M$ = " " THEN GOSUB
     700:GOTO 50
90   IF M$ = "I" THEN P= -40
100  IF M$ = "J" THEN P= -1
110  IF M$ = "K" THEN P=1
120  IF M$ = "M" THEN P=40
130  A=A+P:B=B+P
140  C=C+P:D=D+P:GOSUB
     600
150  POKE A,T:POKE B,T
160  POKE C,T:POKE D,T
170  GOTO 50
600  IF A<1024 OR A>2023 THEN
     A=A-P
610  IF B<1024 OR B>2023 THEN
     B=B-P
620  IF C<1024 OR C>2023 THEN
     C=C-P
630  IF D<1024 OR D>2023 THEN
     D=D-P
635  IF M$ = "Q" THEN RUN
640  RETURN
700  POKE 53280,1
710  POKE 53281,0
720  T=INT(RND(0)*255)
730  POKE A,T:POKE B,T
740  POKE C,T:POKE D,T
750  RETURN
```

—Charles Ardai

VIC CHOPPER: VIC-20

Shawn Leaf, 12, of Trout Creek, Michigan, sent in this program for the VIC-20. It uses text statements to create a helicopter. You press H to go faster, L to go slower, R to go in the opposite direction and F to go forward again. Pressing the S key makes the helicopter hover. The program also makes a great helicopter noise as you fly back and forth. NOTE: In lines 510 and 610, *italics* mean press the combination of keys indicated. CRSR-L means press shift and the left/right CRSR key. CRSR-DN means press the up/down CRSR key.

```
10   REM CHOPPER
20   POKE 36878,15
30   POKE 650,255
40   POKE 36879,8
50   B=1
55   D$ = "F"
60   PRINT CHR$(147);CHR$(5)
70   GET Z$
80   IF Z$="H" THEN M=0
90   IF Z$="L" THEN M=40
100  IF Z$="R" THEN D$="R"
110  IF Z$="F" THEN D$="F"
120  IF B>254 THEN D$="R"
130  IF B<1 THEN D$="F"
140  IF D$="F" THEN GOSUB 500
150  IF D$="R" THEN GOSUB 600
160  PRINT CHR$(147); TAB(B);A$
170  GOSUB 1000
180  IF D$="R" THEN B=B-1
190  IF D$="F" THEN B=B+1
200  GOTO 70
500  REM FORWARD
510  A$="———CRSR-DN CRSR-L
     CRSR-L CRSR-L CRSR-L CRSR-L
     SHIFT-J——#"
520  IF Z$="S" THEN B=B-1
530  RETURN
600  REM REVERSE
610  A$="———CRSR-DN CRSR-L
     CRSR-L #——SHIFT-K"
620  IF Z$="S" THEN B=B+1
630  RETURN
1000 POKE 36877,203
1010 POKE 36877,0
1020 FOR A=1 TO M: NEXT A
1030 RETURN
```

—Shawn Leaf

(BASIC Training continues on next page)

BASIC PLUS

Introducing Assembly Language

BY MARK SUTTON-SMITH

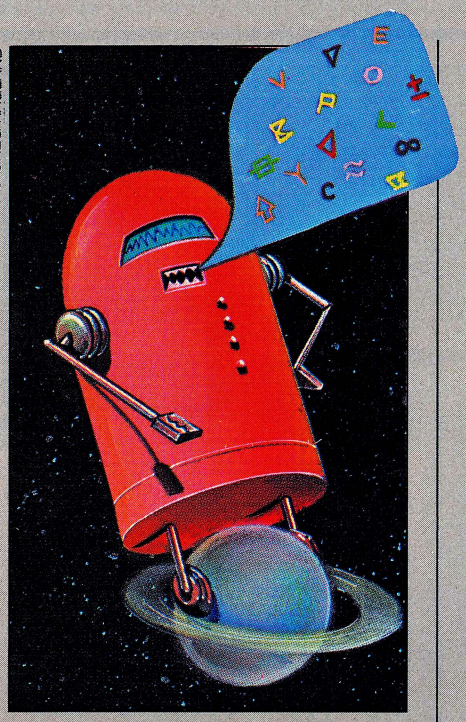
Talking to a computer is a lot like having a conversation with a being from the planet Xenon. First, you say something in English. The Xenonite then translates what you said from English to Xenonese. The Xenonite thinks over its response (naturally, it thinks in Xenonese). It then translates its answer into English, so you can understand it.

But what if you could speak Xenonese yourself? Then, you could tell your Xenonish friend exactly what's on your mind. All those steps would be eliminated.

Assembly language is as close as we can come to the computer's native language, *its* Xenonish. Assembly is only one step away from the actual binary machine code of zeros and ones that your computer runs on. That's why it is called a "low-level language." (Back when electronic computers were first invented, there were *no* computer languages at all. Everything had to be entered as machine code of 0's and 1's.)

BASIC, Pascal, and most other languages you are familiar with are known as "high-level" languages. A program in a "high-level" language like BASIC doesn't look anything like machine code. As a result, every BASIC statement must be translated (or compiled) into several machine code statements.

Most forms of BASIC have to be



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translated *every* time a program is run. This added step takes time. Translating one command may only take a fraction of a second. But multiply that by hundreds of thousands of commands, and you see why BASIC is, comparatively, so slow.

This is one of the reasons computer games are almost always written in Assembly language. In BASIC, it would take five minutes for Pac-Man to drag himself across the screen. Assembly also lets us get at parts of the computer that "high-level" languages can't touch.

So why don't we program in Assembly language all the time? There are a number of reasons.

Assembly is more difficult and tedious to use than a high-level language. In a language like BASIC, we can use English words like PRINT or RETURN. In Assembly, RETURN looks like RTS.

More importantly, each "high-level" statement will do the work of a number of "low-level" statements. Think of it this way: a "high-level" robot language might have a command like "go to the kitchen and get me a piece of pie." The Assembly language version would be something like "go into the hall, turn right, go forward 15 feet, turn left," and so on.

Of course, the "high-level" robot might only be able to go to the kitchen for pie. You could tell the Assembly language robot to get pie from other rooms in the house —the dining room, for example. It would just take a lot more programming.

To see the difference in an actual program, look at the BASIC and Assembly programs on the opposite page. Believe it or not, they both do the same thing!

If you're interested in becoming a professional programmer, or if you just want to learn what is really going on inside your computer, you should learn Assembly language. Next month, we'll talk about different kinds of Assembly language, and what you need to start programming in Assembly.

MARK SUTTON-SMITH is one of ENTER's Contributing Editors

BASIC VS. ASSEMBLY: A SAMPLE

Both of these programs do the same thing. They add variable X and variable Y, and put the result in variable A.

BASIC:

```
10  A=X+Y
20  END
```

ASSEMBLY LANGUAGE:

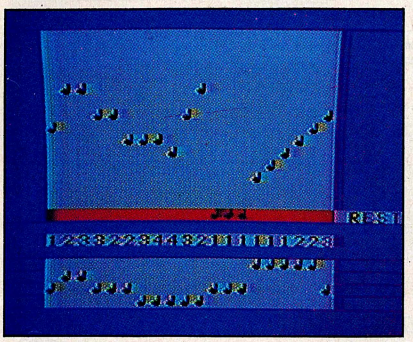
```
X         DS    2
Y         DS    2
A         DS    2
START     LDA X
          CLC
          ADC Y
          STA A
          LDA X+1
          ADC Y+1
          STA A+1
```

MUSIC PROCESSOR: TI 99/4A

Here's a program for the TI 99/4A. It lets you compose short melodies by arranging musical notes on your TV screen. It was sent to us by Tommy Schaus, age 13, of Glen Ellyn, Illinois.

You use your up and down arrow keys to place the notes where you want, and your right arrow key to move on to the next note. Placing a note in the REST area will make that note silent.

Put a number between one and four under each note to set its volume. Then use the arrow keys again to set the duration of each note. When you've finished, the melody will play. Press R to play it again, or S to start over.




```
10  DIM D(20), F(20), V(20)
20  U=0
30  CALL CLEAR
40  CALL SCREEN (5)
50  RANDOMIZE
60  CALL CHAR (144,
    "080808287878308")
70  CALL CHAR (152,
    "080808287878308")
80  CALL COLOR (16,2,7)
90  CALL CHAR (129,"FF")
100 CALL CHAR (130,
    "0101010101010101")
110 CALL CHAR (131,
    "00000000000000FF")
120 CALL CHAR (132,
    "0808080808080808")
130 CALL VCHAR (1,5,130,24)
140 CALL VCHAR (1,26,132,24)
150 CALL HCHAR (1,1,131,32)
160 CALL HCHAR (17,1,129,32)
170 CALL HCHAR (19,1,131,132)
180 CALL HCHAR (24,1,129,32)
190 CALL COLOR (9,15,15)
200 FOR A=6 TO 25
210 CALL VCHAR (2,A,96,15)
220 NEXT A
230 FOR A=6 TO 25
240 CALL VCHAR (20,A,96,4)
250 NEXT A
260 CALL HCHAR (18,6,96,20)
270 CALL COLOR (10,7,7)
280 CALL HCHAR (16,6,104,20)
290 CALL HCHAR (16,26,96,6)
300 FOR A=3 TO 8
310 CALL COLOR (A,2,15)
320 NEXT A
330 CALL HCHAR (16,27,82)
340 CALL HCHAR (16,28,69)
350 CALL HCHAR (16,29,83)
360 CALL HCHAR (16,30,84)
370 CALL COLOR (15,2,15)
380 N=9
385 REM INPUT NOTES
390 FOR A=6 TO 25
400 IF N <> 16 THEN 430
410 CALL HCHAR (N,A,152)
420 GOTO 440
430 CALL HCHAR (N,A,144)
440 CALL KEY (0,K,S)
450 IF K=69 THEN 1000
460 IF K=88 THEN 1070
470 IF K=68 THEN 1110
480 GOTO 440
490 U=0
500 N=18
510 FOR A=6 TO 25
520 CALL KEY (0,K,S)
530 IF S=0 THEN 520
540 IF(K>52)+(K<49) THEN 520
550 CALL HCHAR (N,A,K)
560 U=U+1
570 V(U)=(K-49)*7
580 NEXT A
585 REM LENGTH OF NOTES
590 U=0
600 N=22
610 FOR A=6 TO 25
620 CALL HCHAR (N,A,144)
630 CALL KEY (0,K,S)
640 IF K <> 69 THEN 680
650 IF N=20 THEN 630
660 N=N-1
670 CALL HCHAR (N+1,A,96)
680 IF K <> 88 THEN 720
690 IF N=23 THEN 630
700 N=N+1
710 CALL HCHAR (N-1,A,96)
720 IF K=68 THEN 740
730 GOTO 620
740 U=U+1
750 D(U)=(N-19)*200
760 NEXT A
770 FOR U=1 TO 20
780 IF F(U) > =110 THEN 800
790 F(U)=110
800 CALL SOUND (D(U),
    F(U),V(U))
810 NEXT U
820 CALL KEY (0,K,S)
830 IF K=82 THEN 770
840 IF K=83 THEN 10
850 GOTO 820
1000 IF N < 3 THEN 440
1010 N=N-1
1020 IF N < =14 THEN 1050
1030 CALL HCHAR (N+1,A,104)
1040 GOTO 400
1050 CALL HCHAR (N+1,A,96)
1060 GOTO 400
1070 IF N=16 THEN 440
1080 N=N+1
1090 CALL HCHAR (N-1,A,96)
1100 GOTO 400
1110 U=U+1
1120 IF N <> 16 THEN 1150
1130 F(U)=20000
1140 GOTO 1160
1150 F(U)=((16-N)+3)*40
1160 NEXT A
1170 GOTO 490
```

—Tommy Schaus

INPUT

ENTER POLL #7

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I. Tell us about yourself:

Name_____

Address_____

City_____ State & Zip_____

Grade___ Age___ Male___ Female___

T-shirt size Kids L___ Adult S___ M___ L___

II. We'd like to know about you and computers:

A. Does your family own a computer?
___No, but we plan to buy one in the near future.
___No, and we have no plans to buy one at this time.
___Yes. Which kind? ___Adam ___Apple ___Atari ___IBM ___Commodore 64 ___VIC-20 ___Timex/Sinclair ___TRS-80 (model?)_____ ___T.I. 99/4A ___Other (Indicate name and model)_____
(If you answered "Yes," please complete sections B through E.)

B. What peripherals does your family own? (Check all that apply) ___Video game player ___Disk drive ___Joysticks ___Printer ___Cassette drive ___Modem ___Touchpad ___Light pen ___Mouse ___Speech synthesizer ___Other (please explain)_____
_____

C. What do you and your family do with your computer? (Check all that apply) ___Play games ___Homework ___Word process ___Create graphics ___Write original programs
What else?_____

D. How often does your family buy new software?
___Every month ___Every 2–6 months
___Once or twice a year
How many software packages do you buy at each purchase? ___1 ___2–5 ___6–10 ___More than 10

E. What type of software program does your family buy most often? (Check *only* one)
___GAMES (If yes, what kind? ___Arcade-style ___Text Adventure)
___BUSINESS
___EDUCATIONAL (If yes, what kind? ___ Music ___Art/Graphics ___Computer Programming Aides ___Math ___Science ___Social Studies ___Foreign Language ___Spelling ___Reading/Writing Skills)
___OTHER (What kind? _____)

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_____
_____

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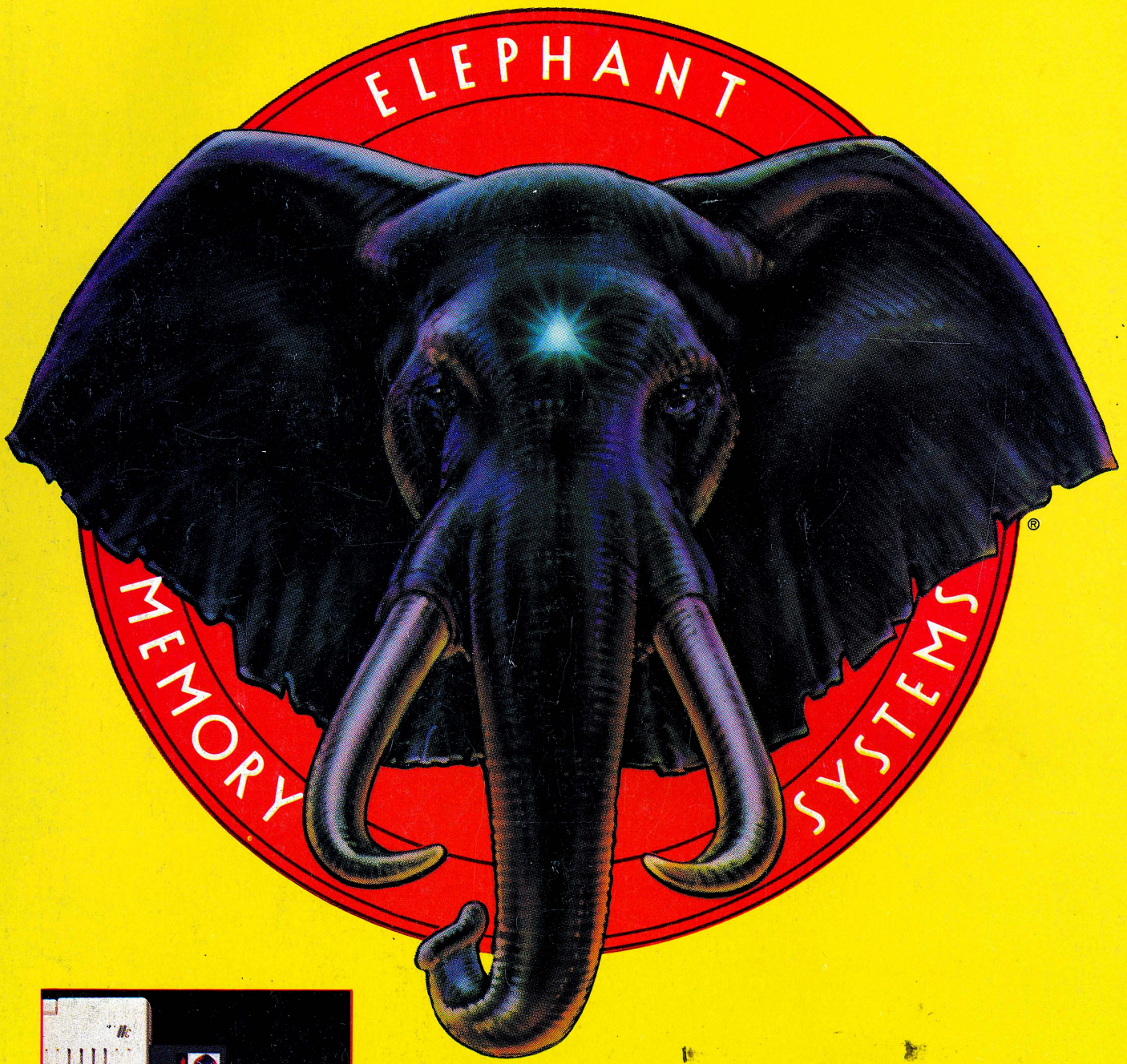

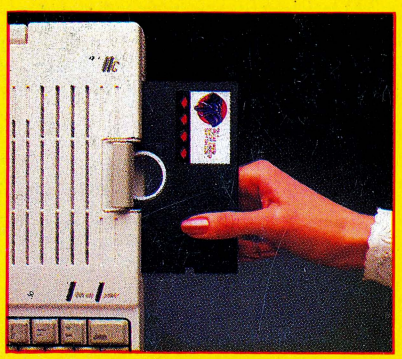

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